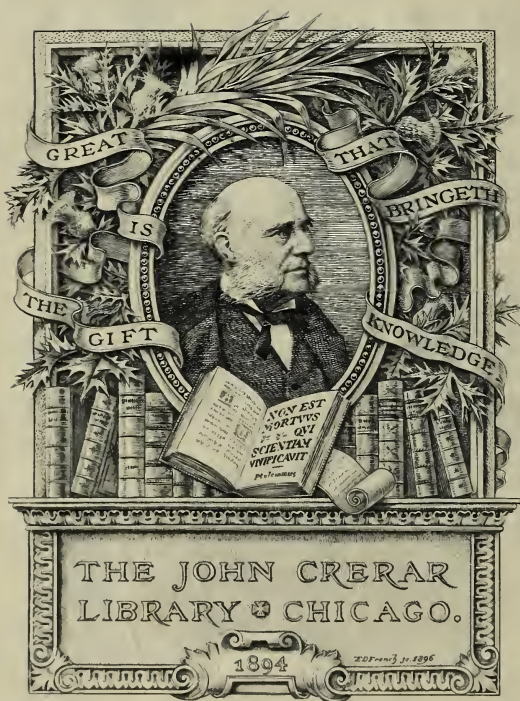






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THE
UNIVERSITY
OF ARIZONA.

Sixth Annual Register,

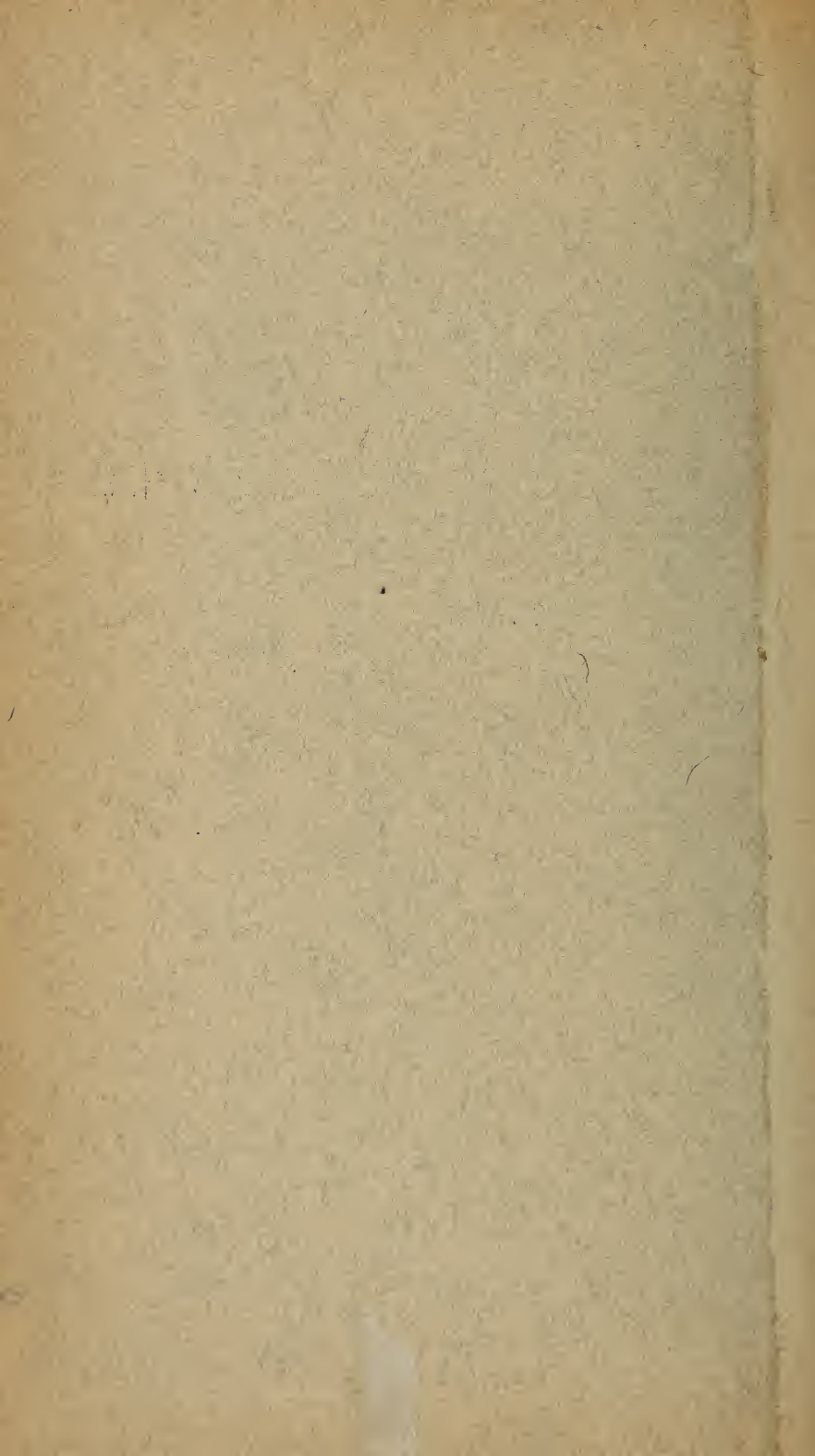
1896-97.

WITH

Announcements for 1897-98.

Tucson, Arizona.

1897.



THE
JOHN CRERAP
LIBRARY



UNIVERSITY OF ARIZONA

Withdrawn

THE

UNIVERSITY

OF ARIZONA.

Sixth Annual Register,

1896-97.

WITH

Announcements for 1897-98.

Tucson, Arizona.

1897.

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G F

CALENDAR, 1897-98.

1897.

March 19, Friday.....Second Term ended
March 23, Tuesday.....Third Term began
June 1, Tuesday.....Third Term ended
June 2, Wednesday.....Commencement Day
September 20 and 21, } Entrance Examinations at University
Monday and Tuesday }
September 22, Wednesday.....Registration Day
September 23, Thursday.....First Term begins
November 25 and 26, Thursday and Friday } Thanksgiving
} Recess
December 22, Wednesday.....First Term ends

1898.

January 3, Monday..... } Registration Second Term,
} Second Term Begins
February 4, Friday.....Arbor Day
February 22, Tuesday.....Washington's Birthday
March 18, Friday.....Second Term ends
March 22, Tuesday.....Third Term begins
June 1, Wednesday.....Third Term ends
June 2, Thursday.....Commencement Day



BOARD OF REGENTS.



Ex-Officio.

HON. BENJAMIN J. FRANKLIN.....*Governor of Arizona*

HON. THOS. E. DALTON.....*Superintendent of Instruction*

Appointed by the Governor.

HOWARD BILLMAN, A. M., *Chancellor*.....Tucson

JOHN H. MARTIN, *Secretary*.....Tucson

SELIM M. FRANKLIN, Ph. B., *Treasurer*.....Tucson

M. G. SAMANIEGO.....Tucson



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FACULTY, ETC.

(Arranged in groups in order of appointment).

HOWARD BILLMAN, A.M.,
President, Professor of Civics.

WILLIAM PHIPPS BLAKE, Ph., B., A. M.,
*Professor of Geology, Metallurgy and Mining. Director
School of Mines.*

JAMES WILLIAM TOUMEY, B. S.,
*Professor of Biology. Botanist and Entomologist, Agri-
cultural Experiment Station.*

*EDWARD MARSHALL BOGGS, C. E.,
*Professor of Civil and Hydraulic Engineering. Com-
mandant of Cadets. Irrigation Engineer and Meteor-
ologist Agricultural Experiment Station.*

HOWARD J. HALL, A. B.,
Professor of English. Librarian.

ROBERT HUMPHREY FORBES, B. S.,
*Professor of Chemistry. Chemist Agricultural Experi-
ment Station.*

WILLIAM STOWE DEVOL, B. Agr.,
*Professor of Agriculture. Director Agricultural Experi-
ment Station.*

JOHN A. ROCKFELLOW, A. M.,
*Professor of Mathematics. Principal of Preparatory De-
partment.*

SHERMAN M. WOODWARD, A. M.,
Professor of Physics and Mechanics.

GERTRUDE B. HUGHES WOODWARD, (Gr. N.E.Cons.)
*Instructor in English Branches, Elocution and Physical
Culture.*

ANNIE GRAHAM ROCKFELLOW, (Mass. Inst. Tech.)
Instructor in Preparatory Department.

*Absent on leave during year 1897-98.

CHARLES E. VAN BARNEVELD, M. E.,
Assistant in Mineralogy and the School of Mines.

MARY BERNARD AGUIRRE,
Instructor in History and Spanish.

MONTFORD MENDENHALL,
Instructor Stenography and Commercial Branches.

HERBERT BROWN,
Curator of Territorial Museum.

MRS. S. A. BUELL,
Matron of Dormitory.

STANDING COMMITTEES OF THE FACULTY.

PREPARATORY DEPARTMENT:—Profs. Rockfellow, Hall,
Miss Rockfellow.

ENTRANCE REQUIREMENTS TO UNDERGRADUATE DEPARTMENT:—Profs. Toumey, Boggs, Hall.

COURSE OF STUDY:—Profs. Blake; Devol, Forbes, Rockfellow, Hall.

SPECIAL STUDENTS IN UNDERGRADUATE DEPARTMENT:—Profs. Boggs, Forbes, Woodward, Devol, Blake.

PROGRAM:—Profs. Toumey, Rockfellow, Woodward.

ATHLETICS:—Profs. Woodward, Van Barneveld, Forbes.

ASSEMBLY AND PUBLIC EXERCISES:—Profs. Hall, Devol, Mrs. Woodward.

LOCATION, CLIMATE, ETC.

The University of Arizona is located near Tucson, the county seat of Pima county, and one of the largest towns in the Territory.

Tucson is on the main line of the Southern Pacific railway, 312 miles west of El Paso, Texas, and 500 miles east of Los Angeles, Cal. It is easily reached from east and west without change and has railway connections with the central and northern portions of the Territory *via* Maricopa, and with the northeastern States *via* Deming. The town lies in a broad, flat valley, at an elevation of 2400 feet above the sea level, and is surrounded by mountains. Its dry and healthful situation with its mild and equable climate have made Tucson a famous health resort, particularly for pulmonary patients.

The climate is as fine as can be found in the arid region of Western America, which is justly celebrated for its excellence. The winter climate is especially good. Its temperature is cool and strengthening without being severe. The lowest temperature recorded during the average year is about 20 degrees above zero Fahrenheit. Snow has fallen in the town only once in a long series of years, although the surrounding mountains are covered with snow every winter. But little rain falls during the winter; fogs are unknown; cloudy days are rare, the percentage of sunshine throughout the winter being greater than that recorded at any other place in the United States. In summer the temperature ranges high, but the dry heat of this region differs greatly from the moist and oppressive heat of the eastern and gulf states. Owing to the extreme dryness of the air the highest temperatures known are less oppressive to the senses, and less dangerous to the health, than the summer heat of the upper Mississippi valley states.

The total amount of rainfall averages less than twelve inches. Of this amount fully one half falls during July and August; yet the amount is so small as not to materially increase the atmospheric humidity, and the summers are found to be remarkably healthy. In general the climate may be described as well suited to nearly all people, but is particularly beneficial to the young, and to those who cannot endure with comfort or safety the extremes of temperature and the sudden changes of northern climates.

The University was established by an act of the Territorial Legislative Assembly passed in 1885. A tract embracing

forty acres of land lying just outside the city limits was selected as a site and was donated by citizens of Tucson. A contract for erecting the main building was let in October, 1887, but owing to financial delays the building was not opened to students until October 1, 1891.

The site selected is upon high ground about a mile from the business center of the city. On every side it commands a view of mountain scenery of remarkable extent and grandeur. The location cannot be surpassed for healthfulness.

The University possesses its own water system. The supply is drawn from a well on the premises 100 feet deep, and is of unusually good quality.

BUILDINGS.

The main building is two hundred feet by one hundred and five feet, two stories in height, the lower story of gray stone, the upper of red brick, and is completely surrounded by a wide two-story veranda. This building contains the offices, recitation rooms, laboratories, and apparatus rooms of the various departments; an assembly room, the libraries of the University and Experiment station, and the Territorial Museum.

Adjoining the main building is the mining annex, eighty by sixty feet, filled with metallurgical machinery.

Three cottages have been built. They are of brick, two stories in height, and were intended to accommodate each two families. Originally designed as homes for instructors, owing to the pressure for accommodation for students on the University grounds, two of these have been converted into homes for young ladies and furnish excellent accommodation for twenty-five persons.

A dormitory built of a fine quality of gray stone, two-stories in height, has been provided as a home for male students. It contains a students' dining room, kitchen connected therewith, and twenty rooms, each large enough to furnish accommodation for two students.

Other buildings are the boiler-house, which also contains the well and pumps whereby the water supply for irrigation and general purposes is obtained; the new green-house eighty by twenty-one feet, built wholly of glass; the old green-house, now used as a propagating house, also of glass; and the cottage occupied by the Assistant Horticulturist.

EQUIPMENT.

AGRICULTURE.

The Agricultural Department occupies two rooms upon the first floor and near the central part of the University building, facing west. The equipment has been greatly augmented during the past year. There have been imported from Europe several of the best Azoux models of portions of the domestic animals, showing normal and morbid conditions; also several cases of products of the vegetable kingdom. A very large collection of garden and farm seeds has been secured and arranged in jars and properly labeled. There is also a selection of garden tools, and instruments used in veterinary surgery. Recently there has been imported from Germany a collection of charts illustrating the anatomy and physiology of some of the fruits and grains. Specimens of the best fruits, grains and other farm products are constantly received for examination; also specimens of an abnormal nature. The old green-house, about fourteen by twenty feet in area, is used as a propagating house, and a new one has just been built, twenty-one by eighty feet in size, constructed of glass throughout. Laboratory work is provided for in these green-houses and field work upon the University grounds. To the agricultural department of the general library have been added many of the standard and most valuable of the recent publications upon agriculture in its various branches, and the sciences upon which it is based.

The Arizona Agricultural Experiment Station headquarters are located in the rooms of the Department of Agriculture of the University, and all the bulletins and reports of the Experiment stations of the United States and foreign countries are on file in the Station library, and the principal agricultural and horticultural journals are upon the table of the reading room.

BIOLOGY.

The three rooms occupied by the Department of Biology are located in the southwest half, second floor of the south wing of the University building. These rooms are piped for gas and water and liberally provided with apparatus for research and for giving instruction in biological subjects. Students pursuing histological work are provided without ex-

pense with simple and compound microscopes, as the nature of their work demands. The laboratory is equipped with microtomes, culture baths, oven and other accessories used in modern methods of research.

An herbarium, containing nearly ten thousand sheets of plants, mostly indigenous to the southwest, a large percentage being from Arizona, is an important factor in our equipment. Some fifty cases of insects including one large cabinet is of value in giving instruction in Entomology and to illustrate the economic insects of Arizona. The work in general and systematic Zoology is greatly facilitated by the Herbert Brown collection of birds and by other zoological material which has been brought together during the past five years.

To aid in the study of human and comparative anatomy and physiology we are provided with articulate and disarticulate human skeletons, plaster and *papier-mache* models of the important organs and microscopical preparations illustrating the structure of the various tissues. Our equipment also includes special apparatus for use of advanced students in this department.

THE CHEMICAL LABORATORIES.

The Chemical Laboratories are two in number. The smaller one on the upper floor of the main building is for the use of students and is equipped for teaching the theory and practice of Chemical Science. The room for laboratory work is well lighted, provided with gas, water, working desks, ventilating hoods, an abundance of apparatus and chemicals with which to carry on experimental work, and can be made to accommodate about twenty-four students. Adjoining the large room is a small store room stocked with apparatus for demonstrating the principles of chemistry and containing well selected collections of chemical substances.

The Experiment Station Laboratory occupies three large working rooms and two small store rooms on the lower floor of the main building. This laboratory is devoted to analytical work and chemical investigations relating to the agricultural interests of the Territory. It is excellently equipped for the special lines of investigation in which it is engaged, and although not primarily intended for the use of students, it has educational value to those who desire to witness the operations of a working laboratory. The equipment includes chemical balances, chemical apparatus and supplies, machinery for preparing samples, and special appliances for the analysis of milk, agricultural products, tanning materials, and soils.

QUANTITATIVE CHEMISTRY.

Instruction is provided for the benefit of those students who desire training in quantitative analysis. The facilities include a properly furnished laboratory, balances and other quantitative apparatus. By means of references the students are made familiar with various authorities and the text books are supplemented by laboratory instruction. In connection with this subject attention is given to the calculation of chemical problems.

These courses are of more especial value to students of mining and metallurgy and are taught with a particular view to their utility in that connection.

CIVIL AND HYDRAULIC ENGINEERING.

Recognizing the fact that the first actual engagement secured by the Civil Engineering student will be either in the field with a surveying party or in the drafting office, the equipment of this department has been chosen with a view to developing the highest skill in these fundamental lines of work. Already liberal, it is constantly being enlarged. It embraces surveyors' and engineers' chains; standard field and pocket tapes; plain and solar compasses and transits, engineers' levels; pocket levels; stadia, level and transit rods; aneroid barometers; odometers; pedometers; automatic water registers; hook-gages; three forms of current meters; stop-watch; meteorological instruments; drafting instruments; mechanical calculators; blue print apparatus; a four and one-fourth inch astronomical telescope with equatorial mountings and accessories; celestial sphere, etc.

In addition to the large number of technical books and periodicals contained in the general library, this department possesses a considerable number of valuable reference works concerning its special lines of investigation.

LIBRARY.

The University library contains 2600 bound volumes of which about 1300 are recent works upon natural and applied sciences taught in the courses, 600 are works of standard English literature, 200 are text books and 400 are government publications. In addition to these, there are about 100 volumes of the latest dictionaries and cyclopædias. The reading room contains about fifty periodicals of scientific and general nature.

MINING AND METALLURGY.

The Arizona School of Mines is well equipped for giving both theoretical and practical instruction in the arts of mining, metallurgy and assaying in all its branches.

Attached to the main building is an annex or mill, containing machinery and appliances for crushing, sampling, concentrating, amalgamating, leaching, chlorinating, cyaniding and the electrical treatment of various kinds of ore in large or small lots. The student has access to this apparatus and is required to familiarize himself with its manipulation. Power is furnished from a seventy horse-power boiler, detached from the main building, the steam being carried underground to the engine-room, which contains a thirty-five horse-power engine, built by the Walburn-Swenson Manufacturing Co., of Fort Scott, Kan., and a sixteen horse-power Westinghouse automatic engine, the latter being used for running the dynamo.

The mill building has a storage capacity for ore of fifty to one hundred tons. From the bins the ore passes to the crushing floor above. A seven inch by ten inch Blake crusher is used for coarse crushing, and a Dodge crusher for finer work. Beneath the Blake crusher is a set of fourteen-inch by twenty-inch Cornish rolls, from which the ore passes by a conveyor to the main elevator, which carries it up thirty-one feet to the top of the mill. By means of slides and chutes the crushed ore may be sent at will to various machines to be tested by different methods. For concentration there are provided revolving sizing screens giving facilities for preparing six sizes, besides hydraulic separators for classifying slimes into three grades. The coarser sizes may be worked upon full-sized jigging machines of the Hartz pattern, the finer sizes being jigged upon slide motion machines, and the slimes being worked upon a double Rittinger percussion table, or otherwise, as desired. A small apparatus, run by electric motor, is also provided for dry concentration. Amalgamation tests may be made upon a working scale by different methods, including plates and riffles, pans and settlers, etc. A five stamp gold mill with silvered plates and aprons of the latest and most approved construction by Fraser & Chalmers of Chicago, has recently been added to the mill, thus permitting the working of free-milling gold ores by the usual methods and on a large scale. Several lots of ore have been successfully worked and returns made in gold bullion, thus familiarizing the mining students with all the details of feeding, stamping, cleaning up, retorting, smelting and assaying.

In addition to the five stamp mill a smaller prospecting mill of three stamps has been added so as to work small lots of ore of from 100 to 2000 lbs.

A sampling mill permits of rapid crushing and mixing large samples, preparatory to assaying.

Above the engine-room is the Electrical Laboratory, containing a seventy-five light Mather incandescent dynamo, from which six circuits are distributed to different parts of the University Building. Of these, two circuits are for lighting purposes; one extends to the hoisting motor; another to the motor which runs to the concentrating machinery; another circuit to the fan motors used for ventilating purposes, and the sixth branch goes to the storage batteries which provide current for electrolytic work in the Assay Laboratory.

The Assay Laboratory is one of the most complete in the West in its appointments. This is equipped with assay furnaces for crucible work, for scorifying and cupelling, and for retorting mercury from amalgam. An adjoining room, supplied with water, gas and electric current, has a roomy hood for work involving fumes, with tables and desks for student work, besides all needed appliances for assaying by dry and wet methods including electrolysis.

The laboratory also has desks and fittings for the chemical work required in the metallurgical and mineralogical investigation and analysis of ores, mineral fertilizers and qualitative tests of minerals.

A reagent and assay-supply store-room adjoins this room, and also a balance room with balances of the highest grade and accuracy.

The school is thus prepared to give instruction and at the same time to work ores by the ton, and also to determine the nature and value of obscure and little known mineral substances, specimens of which are received by mail from all parts of Arizona and beyond it, and are examined gratuitously.

PHYSICS.

Three large rooms in the basement of the University Building are set apart for the teaching of Physics.

The facilities for experimental demonstration of all important phenomena are very complete. The lecture room is fitted with shutters, so that it can be instantly darkened. A beam of sunlight, directed by a very fine clock heliostat outside, may be thrown steadily across the lecture table for experiments on light, or used in connection with the solar lantern for a variety of other work. The lecture table is sup-

plied with gas, water, electric currents from primary and storage batteries, and from the large dynamo.

Adjacent to the lecture room is the apparatus room where are kept the many fine instruments owned by the University, among which may be mentioned: An Atwood's machine; Kater's pendulum; whirling table; many balances; barometers; an air pump and accessories; a hand dynamo; a 75-light Mather dynamo (not in apparatus room); many motors; six storage cells; a large number of primary batteries; induction coils; Deprez-D'Arsonval tangent, and sine galvanometers; rheostats; Wheatstone's bridges; a fine testing set; a Wimhurst electric machine; Leyden jars; Geisslers' & Crooke's tubes; diapsons; a sonometer; lenses, prisms, and mirrors of all kinds; a polariscope; steam gauges; indicators; calorimeters; and great quantity of other apparatus, costing in all over \$3000.00.

Both these rooms open into the large physical laboratory, where the students must verify for themselves the laws set forth in text-books and lectures.

REQUIREMENTS FOR ADMISSION, ETC.

Candidates for admission to the University are required to furnish satisfactory testimonial respecting character; and—if they come from other colleges—certificates of regular dismission, together with an official statement, if possible, of the work previously done.

For admission to the Freshman Class, applicants must be at least 16 years of age,* and must pass satisfactory examinations in studies required in the Preparatory Course with the exception of Elementary Biology, Elocution and Physical Culture.

Examination for the Freshman Class will include the following studies:

MATHEMATICS—Arithmetic, entire, including the Metric System; Algebra, through quadratic equations, including factoring, the greatest common divisor, and the least common multiple, as treated by Wentworth or Wells; Geometry, all of plane (Wentworth or Wells).

ENGLISH—A competent knowledge of the elements of English grammar, composition, the elements of rhetoric, and

*In Special cases of students unusually capable and well prepared, this regulation may be abrogated by vote of the Faculty.

the following English classics or acceptable equivalents: Longfellow's *Miles Standish*, *Evangeline*; Burrough's *Birds and Bees*, *Sharp Eyes*; Scott's *Lady of the Lake*; Whittier's *Snow-Bound*.

HISTORY—Ancient, Mediaeval and Modern. (The text-book in use in the Preparatory Department is "Myers' General History"); United States History; and the Science of Government.

NATURAL SCIENCE—Geography, political and physical, as included in "Frye's Complete Geography;" Physics, as much as is contained in "Gage's Introduction to Physical Science." Note-books covering such laboratory work as has been performed by the student should be presented for examination.

LATIN—As comprehended in "Collar & Daniells' Beginners Latin Book" or an equivalent.†

For admission to the First Year Preparatory Class, applicants must have attained the age of 14 years,‡ and must pass satisfactory examinations in Reading, Writing, and Arithmetic as far as percentage, (including fractions and compound quantities), and otherwise show ability to pursue the work outlined.

Students from other institutions of equivalent rank may be admitted to the higher classes upon the presentation of properly authenticated certificates, showing clearly to the satisfaction of the Faculty that they are qualified to proceed with such work.

Arrangements have been made with the Arizona Territorial Normal School, at Tempe, whereby students from that Institution may have their record transferred to the books of the University with full credit, upon presentation of a certificate duly signed by the Principal. Students of this University may also obtain the equivalent privilege at the Normal School by presenting the proper certificate of standing signed by the President.

The Faculty desires to establish such relations with High Schools and other educational institutions as will enable it to accept their certificates without question. To this end presiding officers are respectfully requested to correspond with the President.

†Candidates from other schools not prepared in Latin may substitute German, French or Spanish, in which the requirements will be elementary grammar and ability to translate simple prose.

‡In special cases of students unusually capable and well prepared, this regulation may be abrogated by vote of the Faculty.

REGISTRATION OF STUDENTS.

All students are required to register on registration day of each term, in the President's office. A matriculation fee of \$5.00 is required of all students. Each will receive a card indicating the classes which he is to attend, and a receipt for the matriculation fee, when paid. No class card will be issued until all dues are paid. This card must be presented to the several Professors before enrollment will be permitted. No changes in registration can be made without the consent of the Faculty.

Permission of the Faculty is necessary to register at any time after registration day.

No student shall be permitted to register in the Spring Term of the Senior Year, as a candidate for a degree, who has not previously made up all failures and "conditions" in subjects required for the degree.

TERM RECORDS.

The class standing of each student is determined by the instructor in charge. The method of ascertaining the student's term record is left to the instructor and his report, in all cases, is final.

MONTHLY REPORTS OF STUDENTS.

Reports of standing in classes in Preparatory Department are regularly sent each month to parents and guardians from the President's office. Those to whom these reports are addressed are urgently requested to examine each with care and to spur up delinquent students, or commend those who are diligent, as the case may be. Without such hearty co-operation, good results cannot be anticipated.

FACULTY MEETINGS.

Regular meetings of the Faculty are held weekly.

Students' individual petitions must be in the hands of the President before the hour of Faculty meeting in order to receive attention the same week. Petitions from classes, or from any two or more students, will not be acted upon by the Faculty unless presented in writing to the President, at least two days before the meeting at which action is desired.

THE HUGO ZECKENDORF PRIZES.

A gold medal and a silver medal have been offered as

prizes by Mr. Hugo Zeckendorff, of Tucson, on the following conditions:

1.—The Senior student who presents the best essay upon some subject relating to the duties of citizenship, will be awarded the gold medal.

2.—The student who maintains the best class record throughout the Junior year will be awarded the silver medal.

Both awards are subject to the regulations of the University Faculty.

The awards of these prizes on Commencement Day, 1897, were:

The Gold Medal, for best Senior essay, to Mark Walker Jr., of Tucson.

The silver Medal, for best Junior record, to Granville Malcom Gillett, of Phoenix.

VACATIONS, ACCOMMODATIONS, ETC.

VACATIONS AND HOLIDAYS.

Short vacations (as per Calendar on page 3) are taken at the Holidays and between the Winter and Spring Terms. The long Summer vacation begins about June 1st and continues until near the close of September.

All legal Holidays are observed by the cessation of ordinary University work, and the Thanksgiving Recess extends from the close of regular exercises on the preceding Wednesday until the Monday morning following.

Appropriate exercises may be arranged by the Faculty for any of the legal Holidays, in which the students will be expected to join, if required.

Arbor day has been formally adopted by the University Faculty as the regular Anniversary, on which shall be celebrated the founding of the Institution, in connection with the ceremonies of tree planting.

LIVING ACCOMMODATIONS AND EXPENSES.

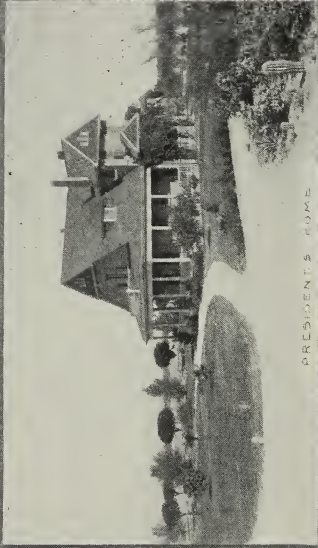
Provision is made as far as possible for furnishing board and rooms for students, of both sexes, upon the University grounds.

Young men have excellent quarters in the new dormitory building.

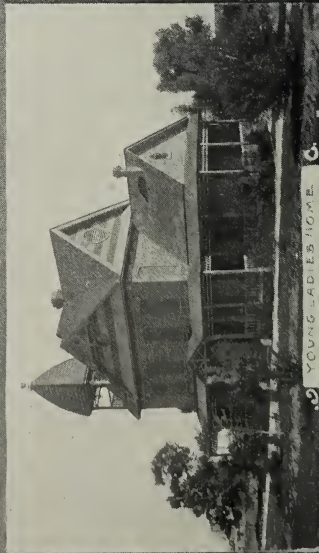
A separate home for young ladies is in charge of Mrs. S. A. Buell, an experienced and capable matron, who, as last



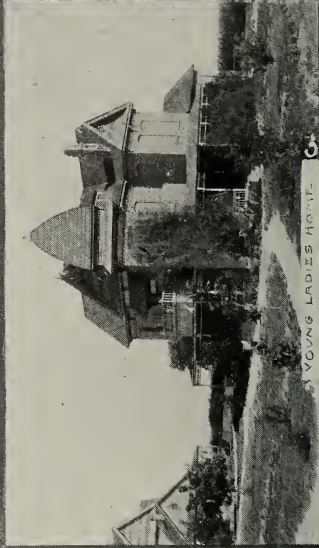
YOUNG MEN'S HOME



PRESIDENT'S HOME



YOUNG LADIES HOME



YOUNG LADIES HOME

RESIDENCE BUILDINGS

year, will have constant supervision of those rooming in "Ladies Hall."

There is no charge for tuition in the University, except for instruction in Commercial branches.

All students are required to pay once only (upon entrance), a Matriculation Fee of five dollars.

Charges will be made for material actually consumed by students in the laboratories.

The expense for board and room rent will amount to about \$15.00 per month. By resolution of the Board of Regents of the University, board is to be paid in advance at the beginning of each term. No reduction will be made for absence for a period of less than one week.

Students will be provided with simple furniture, including single bedstead, mirror, wash-bowl, pitcher and slop jar. They will supply their own mattress, pillow, bed-clothing, towels, etc. They will care for their own rooms, and the halls, staircases, and study rooms of their respective dormitories under the direction of the person in charge.

Text-books required may vary in cost between five and ten dollars in different years of the course.

Economical students should readily go through the year with \$150.00 to \$160.00, excluding clothing.

Members of the battalion will be required to provide themselves with the prescribed uniform. During the past year the cost of uniform with cap, and including transportation charges, has ranged from \$11.40 to \$12.90 according to size. While this uniform has shown better wearing qualities than a civilian suit of equal cost, it is hoped that in future a much more serviceable grade of material can be secured at a slightly advanced cost. Students will thus have choice of grades of material and cost. Parents are urged to consider the matter of uniform when supplying their sons with clothing for the approaching school year. It may be worn on all occasions, and thus will remove the necessity for the usual expenditures for outer clothing other than overcoats.

Provision has been made for the self-support of students to a limited extent.

LITERARY SOCIETY.

The Philomathean Society, an organization of students open to all, holds its meetings in the Assembly room of the University on Friday evenings. Its work embraces general literary exercises and parliamentary usage, and is a valuable adjunct to the regular college course.

MILITARY TRAINING.

Appreciating the importance of military drill as a physical exercise and as an aid to discipline, provision has been made for a course in Military Science and Tactics.

Military drill is required of all male students throughout the Preparatory Course and as far as the end of the Sophomore year unless excused by the Faculty for sufficient cause, and is optional through the remaining years. Students claiming exemption from drill by reason of physical disability will be required to secure from a physician designated by the Faculty, a certificate of incapacity, except when the disability is apparent. In general the officers and non-commissioned officers will be chosen from the higher classes, scholarship as well as proficiency in drill being considered in making promotions.

Each member of the military organization will be required to provide himself with the prescribed uniform within six weeks after his entrance. The uniform consists of cap, coat and trousers of Cadet gray cloth trimmed with black braid and closely resembles the undress uniform worn at the U. S. Military Academy at West Point. Black shoes and white cotton gloves are also required. A uniform vest is prescribed. The purchase of this garment is optional as it is not required to be worn unless the coat is worn unbuttoned. A committee of the Faculty will protect the interests of students by inspecting all uniforms as received from the makers in order to secure good materials and workmanship at a minimum cost.

Owing to the necessity for training officers and non-commissioned officers as well as recruits no attempt has been made during the past year to progress further than the school of the company. Early in the fall term of 1897 the battalion formation will be perfected. By this means a considerable number of cadets will receive instruction and perform the duties of commissioned officers.

A gold medal presented by the Commandant for the best drilled cadet, and a silver medal offered by Prof. Devol for the best drilled recruit, will be competed for on Commencement Day.

An equivalent of the time occupied in military drill will be devoted by female students to physical culture and instruction in the rudiments of hospital practice and prompt relief of the injured.

COURSES OF INSTRUCTION.

The facilities and privileges of the University are open to all qualified persons of either sex, without charge.

The course of study followed may be either *regular* according to a prescribed sequence of studies, requiring examinations and leading to a degree, or *special* for such students as wish to take only a partial or selected course of study without regard to graduation or a degree,

Five regular courses are offered as follows:

I.—General.

II.—Agriculture and Horticulture.

III.—Civil Engineering.

IV.—Mechanical and Electrical Engineering.

V.—Mining and Metallurgy.

The nature and sequence of studies in each of these courses for each term for four years are shown in the following tabular statements.

Students who have obtained full credit for the required work in either of these courses during four years, will be given the degree of Bachelor of Science (B. S.).

Each candidate for graduation is required to present an acceptable thesis embodying the results of a special and thorough study of some subject within the range of the course pursued. The subject of the thesis must be submitted for the approval of the Faculty not later than the opening of the second Term of the Senior year, and the completed thesis must be presented not later than three weeks before Commencement Day.

The advanced degrees of Master of Science and Master of Arts are conferred upon Bachelors, graduates from this University or from institutions of equivalent grade, who have successfully pursued a course of study marked out by the Faculty, requiring not less than one year.

The degrees of Civil Engineer, Mining Engineer, Irrigation Engineer and Electrical Engineer are open to graduates properly prepared, who have pursued special lines of post-graduate work in accordance with Faculty regulations.

I. THE GENERAL COURSE.

This course is here presented as a proper curriculum for the average student, as it embodies the judgement of the Faculty regarding what is most suitable for the broad general culture demanded by modern life. All students who are young enough to delay their technical preparation until after its completion are strongly urged to register in this course.

A careful perusal of the scheme will show that this course includes, practically, the elementary work of the general principal departments of the University. The branches of Mathematics required are only those which will be assigned in any event, as a condition for graduation from the University. Thus nothing is required which a regular student can afford to miss, and those who may afterward decide to pursue a particular technical course will have lost little by beginning this course.

This is not the course for those who must quickly acquire a technical training to fit them for the professions at once; but it cannot be too strongly asserted that the time spent in this preliminary general training will be more than made up in the increased capacity for effective work in any field in the years to follow.



GENERAL COURSE.

FRESHMAN YEAR.

FIRST TERM.	Hrs.	SECOND TERM.	Hrs.	THIRD TERM.	Hrs.
English.....	5	English.....	5	English.....	5
Ancient or Modern Language.....	5	Ancient or Modern Language.....	5	Ancient or Modern Language.....	5
Solid Geometry and Conics.....	5	Higher Algebra.....	5	Higher Algebra.....	5
Drawing (Freehand).....	2	Drawing (Freehand).....	2	Drawing (Freehand).....	2

SOPHOMORE YEAR.

English.....	5	English.....	5	English.....	5
Ancient or Modern Language.....	5	Ancient or Modern Language.....	5	Ancient or Modern Language.....	5
Trigonometry.....	5	*Chemistry; Botany.....	5	Botany.....	5
Chemistry.....	5				

JUNIOR YEAR.

History 2, English 3.....	5	History 2, English 3.....	5	History 2, English 3.....	5
Physics.....	5	Physics.....	5	Physics.....	5
Political Economy.....	3	Political Economy.....	3	Political Economy.....	3
Anatomy and Physiology.....	5	Zoology.....	5	Mineralogy.....	5

SENIOR YEAR.

Logic.....	5	Psychology.....	5	History of Philosophy.....	5
Constitutional History.....	5	History of Civilization.....	5	Civics.....	5
Geology.....	5	Ethics.....	5	Astronomy.....	5
				Thesis.....	

*Chemistry ½ term; Botany ½ term.

II. COURSE IN AGRICULTURE.

It is the aim of the University to present a course in Agriculture that will equip the student with a knowledge of the theory and practice of modern Agriculture, such as will enable him to fill positions of trust and importance in the Agricultural Experiment Stations or among the scientific workers for the U. S. Department of Agriculture, as well as to engage successfully in the pursuit of any one or more of the several branches into which the profession of agriculture is now divided.

The first two years in the Agricultural course embrace, with but few exceptions, the studies prescribed for the General Course, and follow still more closely the other Technical courses. In order to secure the greatest benefit from instruction in the special studies in Agriculture, Horticulture and Veterinary Science it is essential that the student shall have had instruction in several of the sciences upon which the proper practice of Agriculture depends. In the course presented here the aim has been to provide such preliminary instruction as is thought most necessary to that end. No text-books have yet been prepared in which the several branches taught are treated in full, comprehensive and thorough manner, so there is a constant reference to numerous publications for collateral reading, including the most important books published upon the respective branches, and the reports and bulletins of the Experiment Stations. Teaching is by means of lectures and recitations from text-books, supplemented by field work, laboratory practice and clinics. The studies required and the time each occupies in this course are set forth in the following schedule:



COURSE IN AGRICULTURE.

FRESHMAN YEAR.

FIRST TERM	Hrs.	SECOND TERM.	Hrs.	THIRD TERM.	Hrs.
Solid Geometry.....	5	Higher Algebra.....	5	Higher Algebra.....	5
English.....	5	English.....	5	English.....	5
Modern Language.....	5	Modern Language.....	5	Modern Language.....	5
Drawing and Shopwork.....	5	Drawing and Shopwork.....	5	Drawing and Shopwork.....	5

SOPHOMORE YEAR.

Trigonometry.....	5	Analytical Geometry.....	5	Meteorology.....	3
Chemistry.....	5	Chemistry ($\frac{1}{2}$ t. run).....	5	Chemistry.....	5
Surveying.....	5	Farms and Farm Equipment.....	5	Soils and Irrigation.....	5
Drawing (Instrumental).....	3	Botany ($\frac{1}{2}$ term).....	5	Botany.....	5
				Photography.....	2

JUNIOR YEAR.

Farm Crops.....	5	Farm Crops.....	5	Breeds of Livestock.....	5
Botany.....	5	Botany.....	5	Entomology.....	5
Anatomy and Physiology.....	5	Zoology.....	5	Forestry.....	3
Floriculture.....	3	Landscape Gardening.....	3	Horticulture and Plant Breeding.....	5

SENIOR YEAR.

Stock Breeding.....	5	Stock Feeding.....	5	Dairying.....	5
Veterinary Medicine.....	5	Veterinary Medicine.....	5	Veterinary Surger.....	5
Geology.....	3	Geology.....	3	Geology.....	3
Fruits and Fruit Culture.....	5	Vegetables and Vegetable Culture.....	5	Thesis.....	3

III. COURSE IN CIVIL ENGINEERING.

This course is designed for young men intending to become civil engineers and surveyors. It provides for thorough training in Mathematics, for instruction in the principles which form the common foundation of all branches of the engineering profession, and for the practical application of these principles to certain lines of technical work. It aims to prepare students for immediate usefulness as subordinates in the field or drafting office, and for positions of greater responsibility after a reasonable amount of experience in the routine of actual practice. Especial prominence is given to those subjects which are the most important factors in the development of the arid region.



COURSE IN CIVIL ENGINEERING. FRESHMAN YEAR.

FIRST TERM.	Hrs.	SECOND TERM.	Hrs.	THIRD TERM.	Hrs.
Solid Geometry.....	5	Higher Algebra.....	5	Higher Algebra.....	5
English.....	5	English.....	5	English.....	5
Modern Language.....	5	Modern Language.....	5	Modern Language.....	5
Drawing and Shopwork.....	5	Drawing and Shopwork.....	5	Drawing and Shopwork.....	5

SOPHOMORE YEAR.

Trigonometry.....	5	Analytic Geometry.....	5	Analytic Geometry.....	5
Chemistry.....	5	Chemistry.....	5	Chemistry.....	5
Surveying.....	5	Surveying.....	5	Surveying.....	5
Instrumental Drawing.....	3	Instrumental Drawing.....	5	Inst. Drawing and Photography.....	5

JUNIOR YEAR.

Calculus.....	5	Calculus.....	5	Calculus.....	5
Physics.....	5	Physics.....	5	Physics.....	5
Mineralogy.....	5	Mineralogy.....	5	Mineralogy and Assaying.....	5
Political Economy.....	5	Photographic Surveying.....	5	Masonry Construction.....	5

SENIOR YEAR.

Mechanics.....	5	Mechanics.....	5	Mechanics.....	5
Geology.....	5	Geology.....	5	Geology.....	5
Water Supply.....	5	Irrigation Engineering.....	5	Municipal and Sanitary Engineering.....	5
Bridge Stresses.....	5	Bridge Designing.....	5	Thesis.....	5

IV. COURSE IN MECHANICAL AND ELECTRICAL ENGINEERING.

This course aims to fit young men in the most practical manner for the professions of Mechanical or Electrical Engineer. It is expected that students completing it will be qualified to enter upon practical work in the drawing office or shop with every prospect of success.

Attention is paid to Mathematics; the Natural Sciences; Drawing; Shop Practice; Machine Design; Installation of Plants; Steam Engines; Dynamos, etc. Practical tests of machinery will be undertaken during the Senior year.

Students in Electrical Engineering will devote their time, in the laboratories and drawing room, to the study of electrical machinery.



COURSE IN MECHANICAL AND ELECTRICAL ENGINEERING. FRESHMAN YEAR.

FIRST TERM.	Hrs.	SECOND TERM.	Hrs.	THIRD TERM.	Hrs.
Solid Geometry.....	5	Higher Algebra.....	5	Higher Algebra.....	5
English.....	5	English.....	5	English.....	5
Modern Language.....	5	Modern Language.....	5	Modern Language.....	5
Drawing and Shopwork.....	5	Drawing and Shopwork.....	5	Drawing and Shopwork.....	5

SOPHOMORE YEAR.

Trigonometry.....	5	Analytic Geometry.....	5	Analytic Geometry.....	5
Chemistry.....	5	Chemistry.....	5	Chemistry.....	5
Surveying.....	5	Surveying.....	5	Surveying.....	5
Instrumental Drawing.....	5	Instrumental Drawing.....	5	Inst. Drawing and Photography.....	5

JUNIOR YEAR.

Calculus.....	5	Calculus.....	5	Calculus.....	5
Physics.....	5	Physics.....	5	Ph sics.....	5
Mineralogy.....	5	Mineralogy.....	5	Mineralogy and Assaying.....	5
Political Economy.....	5	Kinematics and Materials of Construction.....	5	Machine Design.....	5

SENIOR YEAR.

Mechanics.....	5	Mechanics.....	5	Mechanics.....	5
Steam Engine and other Motors.....	3	Steam Engine and other Motors.....	3	Steam Engine and other Motors.....	3
Electricity and Magnetism.....	2	Dynamo and Electric Machinery.....	2	Dynamo Electric Machinery.....	2
Geology.....	5	Geology.....	5	Geology.....	5
Designing and Drawing.....	5	Designing and Drawing.....	5	Thesis.....	5

V. COURSE IN MINING AND METALLURGY.

The course of instruction in Mining and Metallurgy is designed to fit young men for the theory and practice of mining and metallurgy and for the superintendence or management of mines, mills or metallurgical works. It extends over a period of four years and provides for a liberal and special education. The studies for the first two years are nearly the same as those prescribed for the General and Engineering Courses.

The instruction includes lectures and laboratory and mill practice. The various laboratories of the University and of the School of Mines are open to the students of this course. Provision is made for instruction in English, Mathematics, Physics, Chemistry, Mineralogy, Assaying, Mining Methods, Mining and Milling Machinery and Metallurgical Works; besides Surveying, Drawing and Shop-work, as shown in detail in the following tabular scheme:



COURSE IN MINING AND METALLURGY. FRESHMAN YEAR.

FIRST TERM.	Hrs.	SECOND TERM.	Hrs.	THIRD TERM.	Hrs.
Solid Geometry.....	5	Higher Algebra.....	5	Higher Algebra.....	5
English.....	5	English.....	5	English.....	5
Modern Language.....	5	Modern Language.....	5	Modern Language.....	5
Drawing and Shopwork.....		Drawing and Shopwork.....	5	Drawing and Shopwork.....	5

SOPHOMORE YEAR.

Trigonometry.....	5	Analytic Geometry.....	5	Analytic Geometry.....	5
Chemistry.....	5	Chemistry.....	5	Chemistry.....	5
Surveying.....	5	Surveying.....	5	Mine Surveying.....	5
Instrumental Drawing.....	5	Instrumental Drawing.....	5	Inst. Drawing and Photography.....	5

JUNIOR YEAR.

Calculus.....	5	Calculus.....	5	Calculus.....	5
Physics.....	5	Physics.....	5	Physics.....	5
Mineralogy.....	5	Mineralogy.....	5	Mineralogy and Assaying.....	5
Shopwork and Physical Laboratory.....	5	Kinematics and Materials.....	5	Shopwork and Physical Laboratory.....	5

SENIOR YEAR.

Mechanics.....	5	Mechanics.....	5	Mining.....	5
Steam Engines and other Motors.....	3	Steam Engine and other Motors.....	3	Steam Engine and other Motors.....	3
Electricity and Magnetism.....	2	Metallurgy and Assaying.....	5	Metallurgy and Assaying.....	5
Geology.....	5	Geology.....	5	Geology.....	5
Designing and Drawing.....	5	Designing and Drawing.....	5	Dynamo Electric Machinery.....	2
				Thesis.....	

SPECIAL COURSES.

In addition to the foregoing regular courses of study students will be received for special courses, without regard to a degree, in the following subjects: Agriculture and Horticulture, Biology (Botany and Zoology); Chemistry; Civil and Hydraulic Engineering; Drawing, freehand and mechanical; Elocution and Physical Culture; English Language and Literature; Geology and Mineralogy; History and Civics; Mathematics; Mechanical Engineering; Mining and Metallurgy (Mill-work, etc.); Assaying; Modern Languages; Physics.

Besides these subjects, thorough instruction is also provided in Music (Vocal and Instrumental) and in all the branches of a complete business education, including Stenography, Typewriting, Penmanship and Commercial studies.

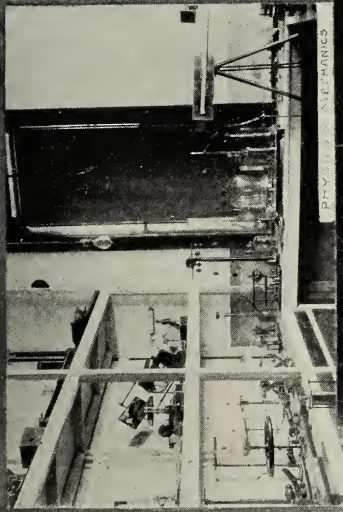
EXPLANATORY OF COURSES OF STUDY.

AGRICULTURE.

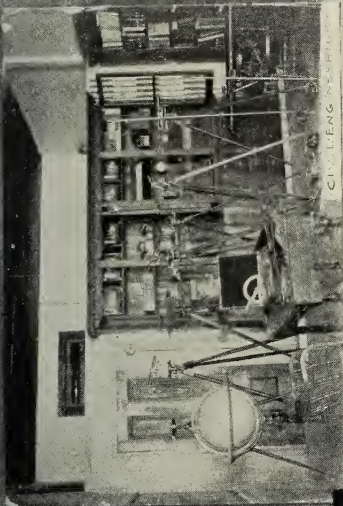
AGRICULTURE: The subject is taken up the second term of the Sophomore year, with lectures and recitations upon the selection of a farm and farm equipment. The text-book is Thomas' Farm Implements and Machinery. The next term the subjects of soils and irrigation are studied in field work, lectures and recitations. The text-books are King's The Soil, and Wilcox's Irrigation Farming. Agriculture in the first term of the Junior year embraces the study of farm crops, general and special, from field work, lectures and recitations from Wilcox's Irrigation Farming and Morrow and Hunt Soils and Farm Crops. Breeds of livestock are studied from lectures and recitations daily for one term, Sanders' Breeds of Livestock, Curtis' Horses, Cattle, Sheep and Swine and Burpee's Poultry Yard being consulted as text-books.

STOCK BREEDING. Lectures and recitations daily during the first term of the Senior year. Miles' Stock Breeding is the text-book.

FEEDING LIVESTOCK is taught by lectures and recitations for one term, with Armsby's Cattle Feeding as the text-book.



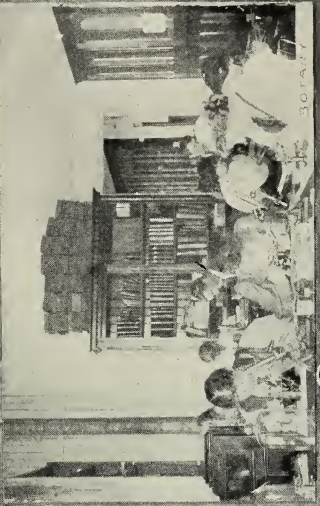
PHYSICS



CHINESE



CHEMISTRY



JAPANESE

CLASS ROOMS

DAIRY FARMING is taught during the last term of the Senior year by means of lectures and recitations. Gurler's American Dairying is to be used as the text-book.

HORTICULTURE begins with the Spring term of the Junior year, embracing this term a brief history of horticulture and the subject of plant breeding. The teaching is by means of laboratory work in the greenhouse, lectures and recitations. The text-books are Slade's Evolution of Horticulture, Bailey's Plant Breeding and Fuller's Propagation of Plants.

FRUIT CULTURE is taught by lectures and recitations, the text-book being Wickson's California Fruits, with especial studies from works upon particular fruits.

VEGETABLE GARDENING. Lectures, recitations and field work are used in teaching this term. Henderson's Gardening for Profit is consulted most.

FORESTRY is taught three days a week during the Spring term of the Junior year, chiefly by recitation from Fuller's Practical Forestry.

LANDSCAPE GARDENING occupies one term of the Junior year, twice a week, with lectures and recitations from Elliot's Landscape Forestry.

FLORICULTURE requires one term, with Henderson's Practical Floriculture as text-book, but lectures and field work occupy most of the time.

VETERINARY SCIENCE, including medicine and surgery, requires daily recitations throughout the Senior year. Law's Veterinary Adviser is used as a text-book, but the recitations are supplemented by lectures and clinic.

ASTRONOMY.

I.—GENERAL ASTRONOMY.—Recitations and Field Practice. The subject is treated in a popular and non-mathematical form according to Young's General Astronomy.

The University possesses a 4 $\frac{1}{4}$ inch equatorial telescope of excellent quality. This instrument under the clear skies of Arizona affords many very interesting views of the heavenly bodies.

2.—ASTRONOMY AND GEODESY.—Lectures, Recitations and Field Practice, embracing the elements of Spherical Astronomy with applications to Geodetic Surveying.

BIOLOGY.

ANATOMY AND PHYSIOLOGY.—Lectures and recitations on human anatomy and physiology supplemented by laboratory work, students making drawings and notes illustrative of their work.

1. **BOTANY, STRUCTURE AND MORPHOLOGY OF PLANTS.** Students study living specimens selected from the local flora. The work is largely of laboratory character supplemented by lectures and recitations from Borgen's Elements of Botany and Gray's Lessons.

2. **SYSTEMATIC BOTANY.**—A study of specimens representative of the different groups of the vegetable kingdom with special reference to the flowering plants. Lectures are given once a week on the economic plants of the families studied.

3. **PHYSIOLOGICAL BOTANY.**—A study of the minute structure and vital functions of plants. The work is largely with the compound microscope.

4. **CRYPTOGAMIC BOTANY AND VEGETABLE PATHOLOGY.**—In this work the student is mostly occupied in the laboratory in the study of the lower orders of plant life. Special attention is given to rusts and smuts and allied forms in their relation to plants of economic importance.

ENTOMOLOGY.—Special attention is given to insects of economic importance. Lectures are given upon the anatomy of insects, their development, transformations, geographical distribution and classification.

ZOOLOGY.—Lectures and text-book work on the principles of classification of animals; their structure and development. Laboratory work is given considerable attention.

CIVIL ENGINEERING.

1. **LAND SURVEYING.**—Recitations, Field Work and Drawing. The elements of general surveying including the use of field instruments and mapping of surveys. Special attention is given to the United States system of public lands surveys.

2. **RAILWAY SURVEYING.**—Recitations, Field Work and Drawing. Methods of reconnaissance, preliminary and location surveys for railways and canals, calculation of earth-work quantities.

3. **TOPOGRAPHIC SURVEYING.**—Recitations, Field Work and Drawing. Consideration of the various methods of mapping topography covering extended lines or compact areas.

4. **PHOTOGRAPHIC SURVEYING.**—Field work and Drawing. A study of modern methods of photo-topography, particularly as developed in the Canadian governmental surveys.

5. **MASONRY.**—Recitations and Drawing. Materials for masonry construction; foundations, bridge piers, retaining walls, dams and arches.

6. **BRIDGE STRESSES.**—Recitations and Drawing. Determination of stresses in bridges, roofs, derricks and cranes, plate-girders, arches, etc., by analytic and graphic methods. Johnson, Bryan and Turneure's Theory and Practice of Modern Framed Structures is used as a text-book in this and the following subject.

7. **BRIDGE DESIGNING.**—Recitations and Drawing. Treats of designing bridges, roofs and other framed structures; calculation of bills of material and estimate of cost.

8. **WATER SUPPLY.**—Lectures and Recitations, Hydrography and Meteorology; run-off from water-sheds; the construction of water-works for cities and towns.

9. **IRRIGATION ENGINEERING.**—Lectures. General consideration of irrigation projects; storage and diversion dams, head-works, regulators and other appliances; construction of canals and other conduits, etc.

10. **MUNICIPAL SANITARY ENGINEERING.**—Lectures. Laying out towns and additions; pavements and sidewalks; plumbing and house drainage; construction and operation of sewers, etc.

DRAWING.

1. **FREE HAND.**—Drawing from copies; from geometrical models, perspective, shading and machine sketching.

2. **INSTRUMENTAL.**—Linear drawing, round writing, lettering, tracing and blue printing.

3. **DESCRIPTIVE GEOMETRY.**—Recitations and drawing; projections, shades and shadows, perspective, tinting.

ENGLISH.

FRESHMAN YEAR, Prose writers of the 19th century, especially DeQuincey, Macaulay, Carlyle; English classics.

SOPHOMORE YEAR, Advanced rhetoric and rhetorical analysis, argumentative and expository composition; Burke, Webster; in the Spring term Elizabethan literature; Lowell.

JUNIOR YEAR, Shakespeare; early 19th century poets; Tennyson; Milton

RHETORICALS: The appearance once during each term in public rhetorical exercises, suited to their position in the course, is required of all students taking courses leading to a degree and of students taking English or Elocution, unless excused by vote of the Faculty. Deficiency in rhetorical is ranked as a deficiency in any other subject; failure to appear on date assigned is regarded as total failure.

ANCIENT AND MODERN LANGUAGES.

The Board of Regents at its meeting in June elected Prof. Frank Yale Adams to the chair of Ancient and Modern Languages, thereby making additional work possible in this Department. Instruction will hereafter be given in French and German, together with the regular courses in Spanish and Latin as heretofore.

MECHANICAL ENGINEERING.

1. DESIGNING OR DRAWING: The designing, drawing and blue printing of machine details and of complete machines.
2. DYNAMO ELECTRIC MACHINERY.—Theory of Dynamos and Motors.
3. ELECTRICITY AND MAGNETISM.—A detailed study of the theory and laws. Reference: Fleming's Alternate Current Transformer, Bedell and Crehose's Alternating Currents.
4. ENGINEERING LABORATORY.—Calibration of gauges, indicators, weirs, meters and thermometry, valve setting, indicator practice and efficiency tests of engines and boilers.
5. KINEMATICS.—Construction on the drawing board of curves, cams, gear teeth, etc., and the study of machine motions of various kinds.
6. MACHINE DESIGN.—Lectures on the design of machinery. Reference: Unwin's Machine Design.
7. MECHANICS OF ENGINEERING.—Statics, dynamics, strength of materials and hydraulics. Text-book, Church's Mechanics of Engineering.

8. **SHOP PRACTICE.**—Practice in carpentry, wood turning, pattern making, molding, forging and machine work.

9. **STEAM AND OTHER MOTORS.**—Lectures and recitations on Thermodynamics, theory of various prime movers, the design and proportions of motive machinery. Reference: Thurston's Manual of the Steam Engine.

MILITARY SCIENCE AND TACTICS.

1. **INFANTRY DRILL.**—Practical training in all movements of the infantry drill regulations of the U. S. Army which are applicable to the battalion, including guard duty, ceremonies, etc.

2. **TACTICS.**—Recitations. A systematic study of the drill regulations of the U. S. Army, by cadet officers and non-commissioned officers.

3. **MILITARY SCIENCE.**—Lectures and Recitations. A study of military topics, forms of official reports and other documents, and the elements of the art and science of war. For cadet commissioned officers.

PHOTOGRAPHY.

The multitude of applications of photography in modern engineering practice has caused provision to be made for practical instruction in this subject, with special reference to its use in general engineering and in topographic surveying.

PHYSICS.

1. **ELEMENTARY PHYSICS.**—Lectures, recitations and laboratory work. Text-book, Gage's Introduction to Physical Science.

2. **PHYSICS.** Lectures and recitations. Text-book, Barker's Physics.

3. **LABORATORY WORK.**—Experiments in the accurate estimation of length, mass and time; preliminary work in mechanics, sound, heat, light and electricity.

4. **LABORATORY WORK.**—Electrical measurements, tests of instruments, efficiency tests of dynamos and motors, photometry, thermometry and calorimetry.

MUSIC.

Little or no attention having been paid hitherto in our public schools to instruction in music, we plan to give such

general instruction as will enable students to read music at sight, and otherwise prepare them to participate in Assembly exercises, and enter upon chorus work.

BOOK-KEEPING AND STENOGRAPHY.

Arrangements have been made to give a course of instruction in Book-keeping and Stenography to such students as may desire to take up these branches in connection with other work in the University. For this special instruction a fee of eight dollars per term of ten weeks will be charged.

PREPARATORY COURSE.

The Preparatory Course, occupying three years, has been especially designed for those who have not had sufficient training to enter the classes of the Freshman Year. It is not the intention to make this an equivalent to the High School, but simply a preparation for actual University work. Thus all the work of the Preparatory years is arranged with an idea of progression from this School through any of the University courses.

It is not the desire of the Faculty to engage in any work which can as well be done in the Public Schools of the Territory, but we have found it impracticable to dispense with classes designed to prepare students for the routine work of the University.

Although this course affords thorough training, as far as it goes, and provides a good foundation for future studies, it is not in any sense complete in itself. One of its main objects is to give training in the best methods of study, to teach pupils to think. In many cases, students lacking neither in zeal nor ability, are at a disadvantage in not knowing how best to direct their energies to the matter in hand. It will be the constant aim of the Instructors in the Preparatory School to overcome this difficulty, which has heretofore been the most serious hinderance to educational progress in the West.

PREPARATORY COURSE.

FIRST YEAR.

FALL TERM.	Hrs.	WINTER TERM.	Hrs.	SPRING TERM.	Hrs.
Arithmetic (Wentworth).....	5	Arithmetic (Wentworth).....	5	Arithmetic (Wentworth).....	5
English.....	5	English.....	5	English.....	5
Geography (Frye).....	5	Geography (Frye).....	5	U. S. History (Faggleston).....	5
Elocution and Physical Culture.....	5	U. S. History (Faggleston).....	5	Elocution and Physical Culture.....	5
		Elocution and Physical Culture.....	5		

SECOND YEAR.

Algebra (Wentworth).....	5	Algebra (Wentworth).....	5	Algebra (Wentworth).....	5
English.....	5	English.....	5	English.....	5
Civil Government.....	5	General History.....	5	General History.....	5
Drawing (Freeland).....	3	Drawing (Freeland).....	3	Elementary Biology.....	2
Elocution and Physical Culture.....	2	Elementary Biology.....	2	Elocution and Physical Culture.....	2
		Elocution and Physical Culture.....	2		

THIRD YEAR.

Algebra (Wentworth).....	5	Geometry (Wentworth).....	5	Geometry (Wentworth).....	5
Latin (Collar & Daniels).....	5	Latin (Collar & Daniels).....	5	Latin (Collar & Daniels).....	5
English.....	2	English.....	5	English.....	5
General History.....	3	Elocution and Physical Culture.....	2	Elocution and Physical Culture.....	2
Elocution and Physical Culture.....	3	Physics (Gage).....	3	Physics (Gage).....	3
Physics (Gage).....	3				

AGRICULTURAL EXPERIMENT STATION.

STATION STAFF.

HOWARD BILLMAN, A. M.,.....	<i>President.</i>
WM. STOWE DEVOL, B. Agr.,....	<i>Director, Agriculturist</i>
.....	<i>and Horticulturist.</i>
EDWARD MARSHALL BOGGS,.....	<i>Irrigation Engineer and</i>
.....	<i>Meteorologist.</i>
JAMES W. TOUMEY, B. S.,.....	<i>Botanist and Entomologist.</i>
ROBERT H. FORBES, B. S.,.....	<i>Chemist.</i>
MARK WALKER, JR.,.....	<i>Assistant Chemist.</i>

STATION COUNCIL.

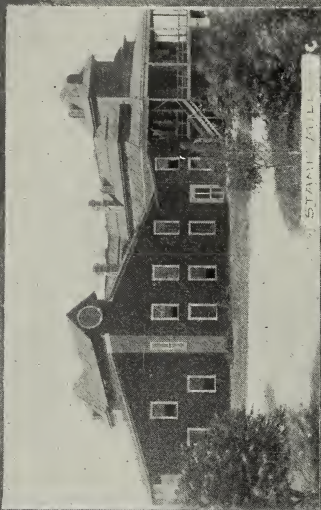
The Board of Regents, the President of the University (President) and Director of the Station, together with the members of the Station Staff.

ESTABLISHMENT AND OBJECT.

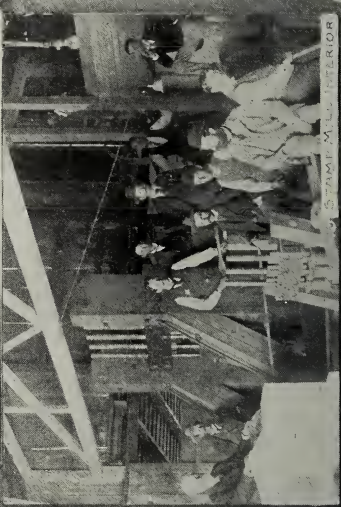
The Agricultural Experiment Station is established according to an Act of Congress, and by the Territorial Legislature has been made a part of the University.

The function of the station is to aid in developing the agricultural and horticultural resources of the Territory, by solving as completely and rapidly as possible some of the complex problems with which the farmers, fruit growers and stock raisers are confronted. In aid of this the National Government has appropriated the sum of \$15,000 to be paid annually to the Board of Regents for this specific purpose.

The lines along which the work of the station runs, embrace the investigations of the conditions of climate, soil and water-supply in the various parts of Arizona, and the adaptability of the conditions found to the growth of different agricultural and horticultural crops; the range of climate suited to the production of these crops; the maximum, minimum and mean amount of water; the successful cultivation of different farm and garden crops; water storage and the development of water from other sources; the best means of applying water; methods of culture; the best season for planting; breeds of farm animals and their improvement to meet local conditions; the introduction of new fruits, vegetables and farm crops and the distribution of plants and seeds; the develop-



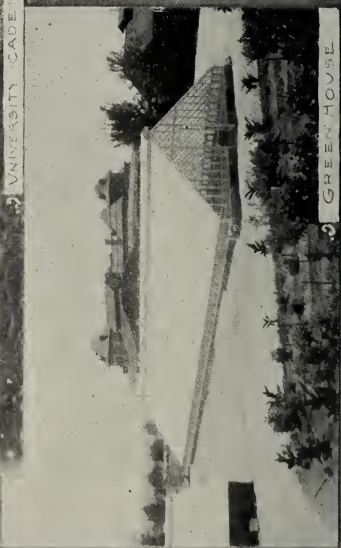
STATE MILLS



STATE MILLS PERIOR



UNIVERSITY CADETS



GREEN HOUSE

ment of forest tree culture; the investigation of diseases affecting the plants and animals of the Territory and the remedies best suited to prevent or eradicate them; the publication of bulletins upon investigations undertaken, and the results obtained. These bulletins are issued periodically and sent free to all who apply for them. The range of the work of the station is only limited by the needs of the Territory and the funds available for use in making the investigations. Those questions which are thought of greatest importance to the Territory come first in the line of work pursued,

To further the ends of the Station in extending its usefulness the co-operation of all interested in its work is earnestly solicited. Suggestions will be gratefully received and inquiries answered cheerfully, wherever possible, by the members of the Staff, each for his own department. No charge is made for answering these questions, and when qualitative chemical analyses or other investigations, of general public interest and benefit are requested, they will be undertaken if possible, and without cost. For quantitative analysis, involving more labor and expense, a small charge is made.

The location of the Experiment Station at the University, is of great benefit, directly and indirectly, to the students in the University. The specialists in the Station work are available as professors in their respective branches in the University, thus affording a larger corps of teachers specially equipped in the several departments. The Station investigations also provide opportunities to students in agriculture and other special branches, for the study of special conditions and methods of peculiar interest to the Territory, which would not otherwise be available,

All communications respecting Station matters should be addressed to:

DIRECTOR EXPERIMENT STATION.

Tucson, Arizona.

THE ARIZONA SCHOOL OF MINES.

This department of the University is provided with a mill for working ores in large or small lots and for sampling ores in large or small quantities from a few pounds weight to a ton or more. Mill tests can be made by either the small three stamp mill or by the large five stamp battery. There are rolls for roller crushing and jigs and Rittinger tables for concentrating ores.

Assaying is taught in the assay and chemical laboratories. Commercial assaying is conducted on a considerable scale in special laboratories and furnaces for the purpose.

There are also facilities for teaching mineralogy and the use of the blowpipe.

In order to promote knowledge of the mineral wealth of Arizona and to disseminate accurate information regarding the minerals and rock formations, and their distribution, qualitative tests or determination of the nature of mineral substances not requiring an assay are made gratuitously upon samples sent by mail or delivered to the Institution without charge.

When quantitative determinations or analyses are required, or when assays showing the quantity and value of a metal or metals are necessary, a charge is made under the provisions of the Territorial law of March, 1897, regulating the prices or fees to be charged for an assay at the University. These rates are shown in the following schedule:

UNIVERSITY OF ARIZONA.

ARIZONA SCHOOL OF MINES.

TUCSON, ARIZONA.

Schedule of Rates for Assaying and Working Ores.

In accordance with the Legislative enactment of March 18th, 1897, the Regents of the University of Arizona have established the following rates for assaying ores taken from deposits and mines in the Territory of Arizona:

Assaying Ores from Arizona.

Silver and Gold, or either	\$.50
Silver, Gold and Copper	1.00
Copper	.50
Ores containing more than three common metals	1.50

The following rates have been established by the Board of Regents for assaying ores taken from deposits or mines without the Territory of Arizona.

Assaying Ores from without the Limits of Arizona.

Silver and Gold, or either alone.....	\$1.00
Copper.....	1.00
Lead.....	1.00
Zinc.....	2.50
Iron.....	2.00
Silica.....	1.50
Alumina.....	5.00

And for other determinations such rate as the Director of the School of Mines may in each instance fix.

Payment in Advance Required.

The Director is required, in all cases, to hold the assay until the fee or charge therefor is paid.

Rates for Sampling.

Lots of 100 pounds or less, including assays of three metals.....	\$5.00
Each additional 100 pounds, to 500 pounds...	1.00
Over 500 pounds to 1 ton.....	10.00
Each additional ton.....	4.00

Reducing to Metal by any Process, as Below.

Ordinary Stamp Mill test and plate amalgam- ation, for first ton or fraction of a ton....	\$20.00
From 1 to 2 tons.....	30.00
Pan Amalgamation, including crushing and assays, per ton.....	20.00
Large lots, proportionately less, per ton; small lots more in proportion.	

Cyanide Process.

The School of Mines is prepared to make experimental tests of ores and of tailings by the cyanide process in large or or small quantities, at rates to be agreed upon with the Director.

Working tests and experiments by other processes may be undertaken at rates to be agreed upon in each instance, depending upon the amount of materials, time and labor required.

Concentrating (Including all Assays.)

Wet or dry test of small lot (under 500 pounds).....	\$15.00
500 pounds to 1 ton.....	20.00
Each additional ton.....	7.00

Qualitative Tests.

The determination of the nature of rare and peculiar minerals, not requiring a chemical analysis, or an assay, is made gratuitously. Samples sent for this purpose should be in their original condition, as broken out, and not crushed to a powder or pulp. Tests requiring determination of the presence of gold or silver must be paid for at assay rates. Samples may be sent by mail at the rate of one cent per ounce. They should be distinctly labeled inside of the package by the name of the sender, and a letter should be posted at the same time giving the full name and address, and enclosing a stamp for the reply. The fee for the assay may be wrapped in paper and sent with the sample.

Samples for assay may also be most conveniently and cheaply sent by mail if under four pounds in weight. Each sample should be labeled by a slip of paper, inside, giving the name and locality of the claim and the address of the sender.

As the express company does not deliver parcels at the University there is a delay of a day or more in the reception of samples sent by express. Unless otherwise directed the certificate of the results of an assay will be forwarded by mail to the consignor of the sample.

Special rates of freight on consignments to the "DIRECTOR of the SCHOOL of MINES," are granted by the Southern Pacific R. R. from points in Arizona. Ask the agent at shipping point for particulars.

All business communications should be addressed to the
ARIZONA SCHOOL OF MINES,

WM. P. BLAKE, Director.

TUCSON, Pima Co., Arizona.

THE TERRITORIAL MUSEUM.

The Arizona Legislature, Session 1893, passed an Act establishing a general Museum at the University. The object of this is to collect materials of all kinds illustrating the resources and development of the region, and particularly to preserve historical relics, including those pertaining to the aboriginal inhabitants.

Donations of specimens and collections will be received and acknowledged with thanks; but no provision has yet been made by the Legislature for the support of this department, aside from the appropriation of \$100 per annum for the salary of a Curator for two years.

A collection has been bequeathed by the late Edward Rose, of Pleasant Valley, Gila county, and the nucleus of additional collections will come from duplicates of the material obtained by members of the Faculty in their annual tours of scientific investigation in the Territory. The collection of minerals made by Mr. Sorin, at the World's Fair, in 1893, is also placed with the foregoing. Historical records of much value are being gradually accumulated as a part of this Museum, and an appeal is made to old settlers and others to bear this fact in mind when making disposition of articles bearing even remote relation to the early pioneers and their history. All records and data of any nature which can be gleaned are worthy of preservation, and we earnestly desire to have them placed in the University where they will always be accessible for reference.

A large and valuable collection of skins of the birds of Arizona has been deposited by Mr. Herbert Brown in the Museum.

It is desired to make the collection of ores and minerals fully represent the great mineral resources of Arizona, and specimens from all of the mines will be thankfully received and acknowledged.

ERRATUM:—In the list of Railroads granting half rates to students going to and returning from the University the name of the Santa Fe, Prescott and Phoenix Railway, should be included.

River Valley Railway Company and the G. V. G. & N. Railway from Bowie to Solomonville, have all very generously allowed students in attendance upon the University half rates when journeying to and from their homes. In the case of students coming to the University these half rates may be secured by notifying the President of the University a sufficient length of time in advance to enable him to secure from the proper authorities the permits. Students at the University may secure transportation to their homes and return, at any time, by making application at the office of the President of the University. The railroad authorities have very kindly supplied a quantity of blanks to be filled out and presented to the proper ticket agents. It is hoped and expected that like concessions may be secured over all the roads in the Territory, as students may desire to travel over the various lines in coming to the University.

Qualitative Tests.

The determination of the nature of rare and peculiar minerals, not requiring a chemical analysis, or an assay, is made gratuitously. Samples sent for this purpose should be in their original condition, as broken out, and not crushed to a powder or pulp. Tests requiring determination of the presence of gold or silver must be paid for at assay rates. Samples may be sent by mail at the rate of one cent per ounce. They should be distinctly labeled inside of the package by the name of the sender, and a letter should be posted at the same time giving the full name and address, and enclosing a stamp for the reply. The fee for the assay may be wrapped in paper and sent with the sample.

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All business communications should be addressed to
HERBERT BROWN, *Curator*.

SPECIAL NOTICE.

REDUCED RAILROAD RATES TO AND FROM THE UNIVERSITY.

The Southern Pacific, the Maricopa, Phoenix & Salt River Valley Railway Company and the G. V. G. & N. Railway from Bowie to Solomonville, have all very generously allowed students in attendance upon the University half rates when journeying to and from their homes. In the case of students coming to the University these half rates may be secured by notifying the President of the University a sufficient length of time in advance to enable him to secure from the proper authorities the permits. Students at the University may secure transportation to their homes and return, at any time, by making application at the office of the President of the University. The railroad authorities have very kindly supplied a quantity of blanks to be filled out and presented to the proper ticket agents. It is hoped and expected that like concessions may be secured over all the roads in the Territory, as students may desire to travel over the various lines in coming to the University.

LIST OF STUDENTS, 1896-1897.

SENIORS.

FISH, CLARA (General Course)	<i>Tucson</i>
HILZINGER, GEORGE (Mining and Metallurgy)	<i>Tucson</i>
WALKER, MARK JR. (Chemistry)	<i>Tucson</i>

JUNIORS.

FERRIN, HATTIE (General Course)	<i>Tucson</i>
GILLETT, GRANVILLE MALCOM (Electrical Eng.) ..	<i>Phoenix</i>
WATTS, MINNIE RUTH (General Course)	<i>Congress</i>
YOUNG, JOHN DESHA (Civil Eng.)	<i>Sacaton</i>

SOPHOMORES.

GARNETT, ROBERT F. (Mining and Metallurgy) ...	<i>Phoenix</i>
MILLER, ERIC REX (Electrical Engr.)	<i>Prescott</i>
MORTON, ROBERT L. (Mining and Metallurgy)	<i>East Randolph, N. Y.</i>

FRESHMEN.

DRAKE, WILLIAM LORD	<i>Tucson</i>
FLOOD, IDA CLARISSA	"
HAYNES, FELIX GRUNDY	<i>Sacaton</i>
HILZINGER, LULU	<i>Tucson</i>
HUGHES, JESSIE	"
LOGAN, HARRY GAYLORD	<i>Phoenix</i>
MOORE, MARY ROSALIE	<i>Wilcox</i>
RICHMOND, CHARLES PIERCE	<i>Phoenix</i>
SPARKS, RALPH WALDO	"
SEARGEANT, JOHN WILLIAM	"
WALTERS, LORENZO	<i>Saric, Sonora, Mexico</i>
WELLES, FLORENCE RUSSELL	<i>Florence</i>

THIRD PREPARATORY.

ANDERSON, JAMES DAVID	<i>Tucson</i>
BROWN, STEPHEN	"
CASTANEDA, RUDOLPH	<i>Benson</i>
DRACHMAN, ALBERT PHIL	<i>Tucson</i>
FERRIN, CLARA	"
GAFF, JOHN HENRY	"
GRIJALVA, ARTURO OCHOA	<i>Benson</i>
KATZENSTEIN, LULU	<i>Tucson</i>
LEWIS, ROSA MAY	"
MONTOKA, FRECIA ROCA	"

RIGGS, LUCY.....	<i>Dos Cabezas</i>
RIESGO, DOLORES.....	<i>Tucson</i>
ROBERTSON, ETHEL MAUDE.....	<i>Tombstone</i>
STEELE, EDWARD.....	<i>Willcox</i>
VAUGHAN, LILLY AWRY.....	<i>Benson</i>
WELLES, PHILIP JUSTICE JR.....	<i>Florence</i>
WILKINSON, INA EUGENIE.....	<i>Tucson</i>

SECOND PREPARATORY.

BROWN, RUTH.....	<i>Tucson</i>
BURR, LILLIE BELL.....	<i>Bisbee</i>
COLBATH, JAMES SOLLITT.....	<i>Taylor</i>
CULVER, EMMA A.....	<i>Tucson</i>
DRAKE, ALFRED GARFIELD.....	"
EARLEY, CLINTON CLAUDE.....	<i>Phoenix</i>
FINLEY, WILLIAM JAMES.....	<i>Tucson</i>
HERRICK, HENRY CLAY.....	<i>Fairbanks</i>
HUGHES, NELLIE LURINE.....	<i>Bisbee</i>
HUGHES, THOMAS.....	<i>Tucson</i>
JOHNSON, EMMA A.....	"
KOHLER, BERNIE.....	"
LONG, JAMES MARCUS.....	<i>Phoenix</i>
McKENNA, STEPHEN S.....	<i>Tucson</i>
MANSFELD, SAMUEL JACOB.....	"
ORNDORF, SETH BUFORD.....	"
PENDLETON, ALEXANDER GARLAND.....	<i>Globe</i>
PRIEST, GERTRUDE ELIZABETH.....	<i>Yuma</i>
RICHARDSON, BERYL.....	<i>Tucson</i>
RIGGS, BARNEY KEMP.....	<i>Dos Cabezas</i>
SCHMID, ARNOLD.....	<i>Bisbee</i>
TOWNER, NORA.....	<i>Albuquerque</i>
WATTS, CARRIE MABEL.....	<i>Congress</i>
WALKER, JOHN HENRY.....	<i>Dragoon Summit</i>
WALKER, SARAH JANE.....	" "
WAKEFIELD, WALTER JAMES.....	<i>Tucson</i>
WOOD, IDA EVELYN.....	<i>Forest Grove</i>
YOUNG, LEVERING.....	<i>Sacaton</i>

FIRST PREPARATORY.

ALEXANDER, ANDREW CHARLES JR.....	<i>Fort Huachuca</i>
ARMITAGE, FANNY.....	<i>Benson</i>
ARMSTRONG, CARRIE.....	<i>San Francisco</i>
ARMSTRONG, VIOLET AGNES.....	" "
BARR, NORMAN STIRRIT.....	<i>Tombstone</i>
BERNARD, ALLEN CHARTAN.....	<i>Tucson</i>
BROWN, HERBERT FREDERICK.....	<i>Bisbee</i>

BROWN, OWEN.....	<i>Tucson</i>
CASTANEDA, HENRY.....	<i>Benson</i>
CHEYNEY, BERENICE.....	<i>Tucson</i>
CONNELL, FRANCES SAFELY.....	"
COOPER, ALFRED F. LUDWIG.....	"
DIAL, JOSEPH H.....	<i>Safford</i>
DODGE, LILLIAN.....	<i>Tucson</i>
ELDRIDGE, MAUD.....	<i>Fort Grant</i>
FOURR, ROBERT NEWTON.....	<i>Dragoon Summit</i>
FELIX, ARTHUR.....	<i>Tucson</i>
FINLEY, CHARLES.....	"
GROESBECK, FRANK BENNETT.....	<i>Safford</i>
GOLDTREE, LEO.....	<i>Tucson</i>
HASSELGREN, HARRY WILLIAM.....	<i>Tombstone</i>
HARRISON, HARRY S. R.....	<i>Tucson</i>
HELLER, RUBY.....	<i>Thomas</i>
HERNDON, THOMAS AUSTIN.....	<i>Parkville, Mo.</i>
HILL, GEORGE VERNON.....	<i>Tombstone</i>
HOFF, MARY AMELIA.....	<i>Tucson</i>
HUGHES, ATANASIA.....	"
HUGHES, EDWIN ALVIN.....	<i>Bisbee</i>
LEVIN, CHARLES.....	<i>Tucson</i>
LIKES, AURELIA MAE.....	<i>Fairbanks</i>
MALONE, MARY JOSEPHENE.....	<i>Lordsburg, N. M.</i>
OWENS, MARY ELIA.....	<i>Safford</i>
ORNDORF, LEE HICKERSON.....	<i>Tucson</i>
PARKS, MADGE LESLIE.....	"
RIGGS, JOSEPHENE D.....	"
RIGGS, LULU K.....	"
SATTERWHITE, CLINTON MELVILLE.....	"
SCHAFER, JOSEPH PETER.....	<i>Dos Cabezas</i>
STRAUSS, RUTH.....	<i>Tucson</i>
SEELEY, PEARL.....	"
STEINFELT, ALBERT LESTER.....	"
SIEWERT, ELSIE.....	"
TREVILLIAN, THOMAS.....	<i>Globe</i>
WARNER, ROBERT ELMORE.....	<i>Tombstone</i>
WEIR, MARTHA McLAIN.....	<i>Tucson</i>
WOOD, LAURA CARMEL.....	<i>Fort Grant</i>
WOOD, PAULINE CLIFTON.....	<i>Tucson</i>
WOODWARD, DEAN.....	<i>Phoenix</i>
VANDERWALKER, GEORGE WILLIAM.....	<i>Dos Cabezas</i>
VANDERWALKER, JOHN HENRY.....	"

SPECIAL.

BAIRD, JOSEPH FRANCIS (Agriculture).....	<i>Concho</i>
BALCOM, WILLIAM ELDER (Assaying).....	<i>Sanla Paula, Cal.</i>

CAMPBELL, ROBERT A. (Botany)	<i>Hanover, N. H.</i>
CARTY, HARRY AGUSTUS (Agriculture)	<i>Holbrook</i>
COSGROVE, JAMES (Assaying)	<i>Bisbee</i>
DARMS, HARRY (Bookkeeping)	<i>Tucson</i>
DRACHMAN, MYRA (General Course)	"
DELANO, CORA KATHRYN (Bookk'g & Stenography)	"
DWIGHT, HENRY EDWARDS (Spanish)	<i>Evanston, Ill.</i>
EVANS, FRANCES MAUD (Elocution)	<i>Tucson</i>
FREDLEY, IDA MAY (Bookk'g and Stenography)	<i>Yuma</i>
FISCHER, LUDWIG FRIEDRICK (Assaying)	<i>San Francisco, Cal.</i>
HESS, CHARLES (Assaying)	<i>Bisbee</i>
HEATON, CHARLES EDWARD (General Course)	<i>Tucson</i>
HILL, CORNELIA LOUISA (Bookk'g and Stenography)	"
HOWARD, OZORA W. (Assaying)	<i>Los Angeles, Cal</i>
HOLLADAY, LULU MAUDE (Bookk'g and Steno.)	<i>Tucson</i>
LUCE, ROBERT FOSCUE (Assaying and Metallurgy) ..	<i>Yuma</i>
MENDENHALL, MONTFORD	<i>Tucson</i>
McDUFFIE, WILLIAM C.	"
NOON, EDWARD E.	<i>Oro Blanco</i>
RIGGS, LIZZIE (Bookkeeping)	<i>Tucson</i>
RUTHERFORD, JOHN C. (Assaying)	<i>Clifton</i>
SERVOSS, WALTER E.	<i>Willcox</i>
SMITH, LAMBERT ROBERTSON (Assaying) ..	<i>Tucson</i>
SIEWERT, EDITH MARGRETT A. (Spanish)	"
SULTAN, WILLIAM SIMON (Assaying)	<i>Globe</i>
TAYLOR, EDWARD C. (Bookkeeping)	<i>Tucson</i>
WETHERELL, CHARLES E. (Mech. Engnr'g)	"
WOLFGANG, HARRY G. (Agriculture)	"
WOOD, EVA M (Latin)	<i>Fon-du-Lac, Wis.</i>
ZABRISKIE, VICTOR HUGO (Bookk'g and Steno.)	<i>Tucson</i>
ZIEGLER, ALBERT HENRY	"
ZUCK, MYRTLE (Botany)	<i>Holbrook</i>

Seniors	3
Juniors	4
Sophomores	3
Freshmen	12
Third Preparatory	17
Second	28
First	50
Special	34

Total..... 151

MILITARY ORGANIZATION, 1896-97.

OFFICERS AND NON-COMMISSIONED OFFICERS.

Commandant of Cadets.....PROF. EDWARD M. BOGGS

First Lieutenant.....GRANVILLE MALCOM GILLETT
Second Lieutenant WILLIAM LORD DRAKE

Quartermaster Sergeant.....LUDWIG FRIEDRICK FISCHER
Chief Trumpeter.....WILLIAM SIMON SULTAN

First Sergeant.....JOHN DESHA YOUNG
Sergeant.....CHARLES PIERCE RICHMOND
Sergeant.....ERIC REX MILLER
Sergeant.....FELIX GRUNDY HAYNES
Sergeant.....ROBERT FISHER GARNETT
Sergeant.....GEORGE OJEDA HILZINGER
Corporal.....HARRY GAYLORD LOGAN
Corporal.....ALBERT PHILLIP DRACHMAN
Corporal.....JAMES MARCUS LONG
Corporal.....CHARLES EDWARD HEATON
Corporal.....HARRY THOMAS RUPKEY
Corporal.....JUSTUS PHILIP WELLES, JR.

WINNERS OF MEDALS, MAY 31st, 1897.

Commandant's Gold Medal for best drilled Cadet, won by Sergeant Charles P. Richmond.

The Devol Medal for best drilled recruit, won by First Sergeant John D. Young.

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The
University

==OF==

Arizona.

Seventh Annual Register,

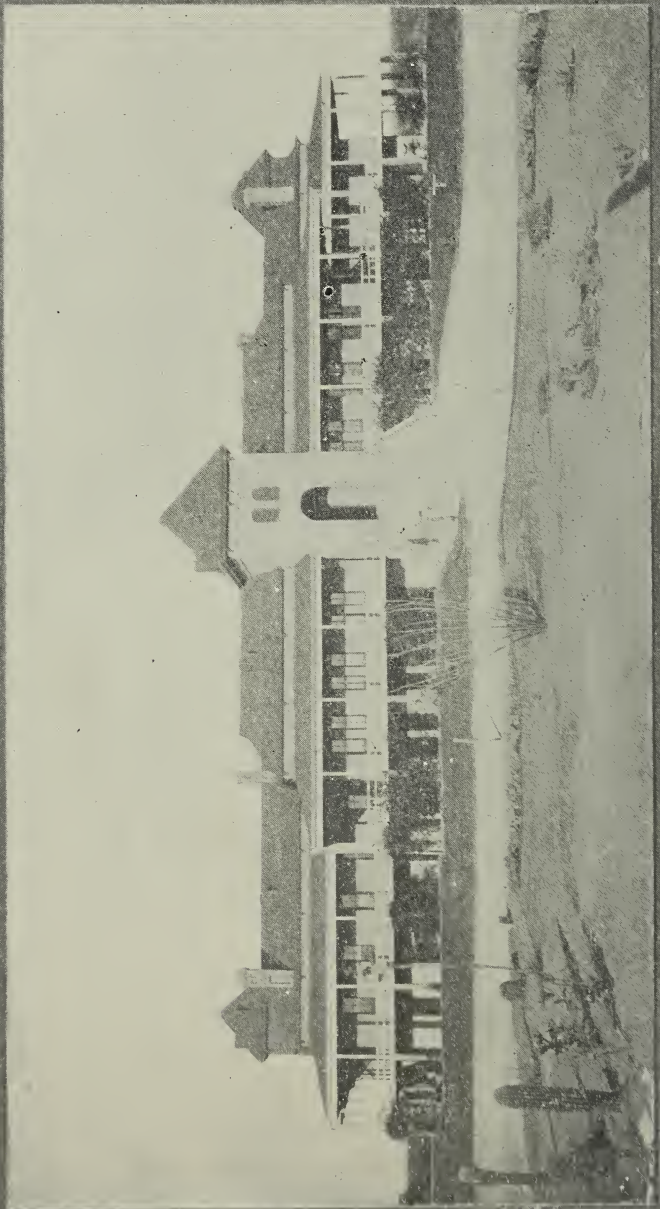
1897-98

..WITH..

Announcements for 1898-99.

Tucson, Arizona,

1898.



UNIVERSITY OF ARIZONA

The
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Tucson, Arizona,

1898.

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CALENDAR 1898=99.

1898.

September 19 and 20, } Monday and Tuesday }	Entrance Examinations at University
September 21, Wednesday.....	Registration Day
September 22, Thursday.....	Recitations Begin
November 24 and 25, Thursday and Friday.. }	Thanksgiving Recess
December 22, Thursday.....	First Term Ends

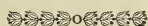
1899.

January 3, Tuesday.....	Recitations Resumed
February 2, Thursday.....	First Semester Ends
February 3, Friday.....	Arbor Day
February 6.....	Second Semester Begins
March 17, Friday.....	Second Term Ends
March 21, Tuesday.....	Third Term Begins
May 30, Tuesday.....	Decoration Day
May 31, Wednesday.....	Recitations End
June 1, Thursday.....	Commencement Day





BOARD OF REGENTS.



Ex-Officio.

HON. MYRON H. McCORD,.....*Governor of Arizona*

HON. ALBERT P. SHEWMAN,.....*Superintendent of Instruction*

Appointed by the Governor.

HON. LOUIS C. HUGHES, A. M., *Chancellor*,.....Tucson

JOHN H. MARTIN, *Secretary*,.....Tucson

MERRILL P. FREEMAN, *Treasurer*,.....Tucson

WILLIAM V. WHITMORE, A. M., M. D.....Tucson



FACULTY, ETC.

MILLARD MAYHEW PARKER, A. M.,

President, and Professor of Civics.

WILLIAM PHIPPS BLAKE, Ph. B., A. M.,

Professor of Geology, Metallurgy, and Mining. Director School of Mines.

JAMES WILLIAM TOUMEY, B. S.,

Professor of Biology, Acting Director, Botanist and Entomologist, Agricultural Experiment Station.

LIEUT-COL. NATHAN HALE BARNES,

[Lieut. U. S. Navy, Retired.]

Professor of Civil and Hydraulic Engineering. Commandant of Cadets. Irrigation Engineer and Meteorologist Agricultural Experiment Station.

HOWARD JUDSON HALL, A. B.,

Professor of English. Librarian.

ROBERT HUMPHREY FORBES, M. S.,

Professor of Chemistry. Chemist Agricultural Experiment Station.

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SHERMAN MELVILLE WOODWARD, A. M.,

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Professor of Mineralogy.

ANDREW J. McCLATCHIE, A. M.,
Professor of Agriculture and Horticulture.

MRS. MARY BERNARD AGUIRRE,
Instructor in History and Spanish.

CLARA MAY RUSSELL,
Instructor in English Branches, Elocution, and Physical Culture.

MRS. EMMA MONK GUILD,
Instructor in Preparatory Department.

MONTFORD MENDENHALL,
Instructor in Commercial Branches and Stenography.

HERBERT BROWN,
Curator of Territorial Museum.

MRS. IMOGEN LA CHANCE,
Matron of Dormitory.

Announcement of Additions to Faculty for 1898-99.

C. S. PARSONS,
Director of Agricultural Experiment Station. Irrigation Engineer.

FRANK E. WINSLOW,
Principal Preparatory Department. Governor of the Barracks.

MARGARET BAIRD RANDAL,
Vocal and Physical Culture, Elocution, English, Assistant Matron.

LOCATION, CLIMATE, ETC.

The University of Arizona is located near Tucson, the county seat of Pima county, and one of the largest towns in the territory.

Tucson is on the main line of the Southern Pacific railway, 312 miles west of El Paso, Texas, and 500 miles east of Los Angeles, Cal. It is easily reached from east and west without change and has railway connections with the central and northern portions of the territory *via* Maricopa, and with north-eastern states *via* Deming. The town lies in a broad, flat valley, at an elevation of 2,400 feet above sea level, and is surrounded by mountains. Its dry, healthful situation with its mild and equable climate have made Tucson a famous health resort, particularly for pulmonary patients.

The winter climate is especially good. Its temperature is cool and strengthening without being severe. The lowest temperature recorded during the average year is about 20 degrees above zero, Fahrenheit. But little rain falls during the winter; fogs are unknown; cloudy days are rare, the percentage of sunshine throughout the winter being greater than that recorded at any other place in the United States. In the summer the temperature ranges high, but the dry heat of this region differs greatly from the moist and oppressive heat of the eastern and gulf states. Owing to the extreme dryness of the air the highest temperatures known are less oppressive to the senses, and less dangerous to the health, than the summer heat of the upper Mississippi valley states.

The total amount of rainfall averages less than twelve inches. Of this amount fully one-half falls during July and August; yet the amount is so small as not to materially increase the atmospheric humidity, and the summers are found to be remarkably healthy. In general the climate may be described as well suited to nearly all people, but is particularly beneficial to the young, and to those who cannot endure with comfort or safety the extremes of temperature and the sudden changes of northern climates.

The University was established by an act of the Terri-

torial Legislative Assembly passed in 1885. A tract embracing forty acres of land lying just outside the city limits was selected as a site and was donated by the citizens of Tucson. A contract for erecting the main building was let in October, 1887, but owing to financial delays the building was not opened to students until October 1, 1891. The site selected is upon high ground about a mile from the business center of the city. On every side it commands a view of mountain scenery of remarkable extent and grandeur. The location cannot be surpassed for healthfulness. The University possesses its own water system. The supply is drawn from a well on the premises one hundred feet deep, and is of unusually good quality.

BUILDINGS.

The main building is two hundred by one hundred five feet, two stories in height, the lower story of gray stone, the upper of red brick, and is completely surrounded by a wide two-story veranda. This building contains the offices, recitation rooms, laboratories, and apparatus rooms of the various departments; an assembly room, the libraries of the University and Experiment Station, and the Territorial Museum. Adjoining the main building is the mining annex, eighty by sixty feet, filled with metallurgical machinery, while near by is a new brick building erected especially for the work in assaying.

Three cottages have been built. They are of brick, two stories in height, and were intended to accommodate each two families. They were originally designed as homes for instructors, but owing to the pressure for accommodation for students on the University grounds, two of the cottages have been converted into homes for young ladies and furnish excellent accommodations for twenty-five persons, while the third is used as a residence for the president.

A dormitory built of a fine quality of gray stone, two stories in height, has been provided as a home for male students. It contains a students' dining room, kitchen connect-

ed therewith, and twenty rooms, each large enough to accommodate two students

Other buildings are the boiler house, which also contains the well and pumps whereby the water supply for irrigation and general purposes is obtained; the new green house, eighty by twenty-one feet, built wholly of glass; the old green-house, now used as a propagating house, also of glass; the cottage occupied by the assistant horticulturist; and a temporary wooden building used as a young men's dormitory. It is expected that in the near future the University will be able to add another wing to the stone dormitory, nearly doubling the present dormitory accommodations, and thus relieving the pressing demands in that direction.

EQUIPMENT.

LIBRARY.

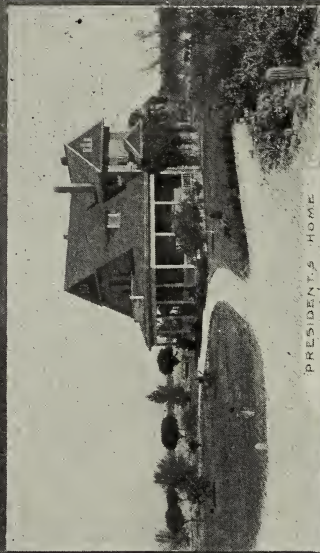
The Library is a department of the University that is increasing in efficiency with the growth of the institution. The books have been selected with great care, with a view both to the requirements of the various departments of instruction and also to the building up of a well-balanced, symmetrical collection of books. All the works are new and standard. The scientific works represent the highest and latest authority while the literary and historical departments contain only the best known and most thoroughly tried authors. A main object in making the selection has been to furnish students with books of the highest class and to encourage them in habits of careful reading. Complete bound sets of the leading American periodicals are being collected every year, so that the library is already valuable as a means of research in present-day problems.

The latest editions of the best cyclopaedias and dictionaries are constantly at the students' disposal. The leading American scientific and literary publications as well as the territorial newspapers are found in the reading room.

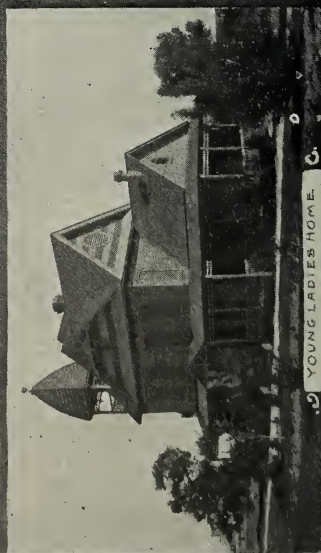
Aside from government publications and pamphlets the



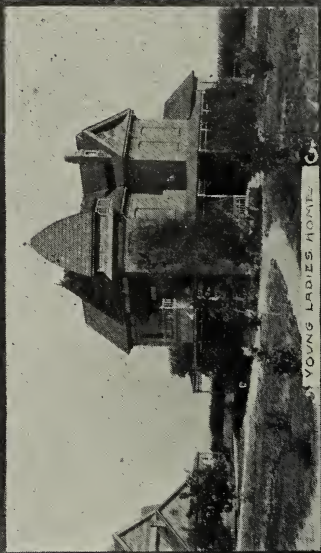
YOUNG MEN'S HOME.



PRESIDENT'S HOME.



YOUNG LADIES HOME.



YOUNG LADIES HOME.

RESIDENCE BUILDINGS

library contains 3,100 bound volumes of which 800 have been added during the present year. Of the whole number about three-fifths are scientific works, the remainder belonging to general literature, biography, and history.

A complete card catalogue of authors and titles is maintained.

CHEMISTRY.

The chemical laboratories are two in number. The smaller one on the upper floor of the main building is for the use of students and is equipped for teaching the theory and practice of chemical science. The room for laboratory work is well lighted, provided with gas, water, working desks, ventilating hoods, an abundance of apparatus, and chemicals with which to carry on experimental work, and can be made to accommodate about twenty-four students. Adjoining the large room is a small store room stocked with apparatus for demonstrating the principles of chemistry and containing well selected collections of chemical substances.

The Experiment Station laboratory occupies three large working rooms and two small store rooms on the lower floor of the main building. This laboratory is devoted to analytical work and chemical investigations relating to the agricultural interests of the territory. It is excellently equipped for the special lines of investigation in which it is engaged, and although not primarily intended for the use of students, it has educational value to those who desire to witness the operations of a working laboratory. The equipment includes chemical balances, chemical apparatus and supplies, machinery for preparing samples, and special appliances for the analysis of milk, agricultural products, tanning materials, and soils.

BIOLOGY.

The biological laboratories occupy three rooms in the south-west half, second floor of the south wing of the main building. These rooms are piped for gas and water and liberally provided with apparatus for research and for giving instruction on biological subjects. Students pursuing histological work are provided without expense with simple and

compound microscopes, as the nature of their work demands. The laboratory is equipped with microtomes, culture baths, oven and other accessories used in modern methods of research.

An herbarium, containing nearly ten thousand sheets of plants, mostly indigenous to the south-west, a large percentage being from Arizona, is an important factor in the equipment. Some fifty cases of insects, including one large cabinet, is of value in giving instruction in entomology and to illustrate the economic insects of Arizona. The work in general and systematic zoology is greatly facilitated by the Herbert Brown collection of birds, and by other zoological material which has been brought together during the past five years.

To aid in the study of human and comparative anatomy and physiology there are provided articulate and disarticulate human skeletons, plaster and *papier-mache* models of the important organs, and microscopical preparations illustrating the structure of the various tissues. The equipment also includes special apparatus for use of advanced students in this department.

AGRICULTURE.

Two rooms upon the first floor and near the central part of the main building are used for the work in the study of agriculture and for the Agricultural Experiment station headquarters. The equipment is quite complete. There have been imported from Europe several of the best Azoux models of portions of the domestic animals, showing normal and morbid conditions; also several cases of products of the vegetable kingdom. A very large collection of garden and farm seeds has been secured and arranged in jars and properly labeled. There is also a selection of garden tools, and instruments used in veterinary surgery. Recently there has been imported from Germany a collection of charts illustrating the anatomy and physiology of some of the fruits and grains. Specimens of the best fruits, grains, and other farm products are constantly received for examination; also specimens of an abnormal nature.

The old green-house, about fourteen by twenty feet in area, is used as a propagating house, and a new one has just

been built, twenty-one by eighty feet in size, constructed of glass throughout. Laboratory work is provided for in these green-houses, and in field work upon the University grounds. The general library contains many of the standard and most valuable of the recent publications upon agriculture in its various branches, and the science upon which it is based. All the bulletins and reports of the experiment stations of the United States and foreign countries are on file in the station library, and the principal agricultural and horticultural journals are upon the table of the reading room.

CIVIL AND HYDRAULIC ENGINEERING.

Recognizing the fact that the first actual engagement secured by the civil engineering student will be either in the field with a surveying party or in the drafting office, the equipment of this department has been chosen with a view to developing the highest skill in these fundamental lines of work. Already liberal, it is constantly being enlarged. It embraces surveyors' and engineers' chains; standard field and pocket tapes; plain and solar compasses and transits; engineers' levels; stadia, level and transit rods; aneroid barometers; odometers; pedometers; automatic water registers; hook gages; three forms of current meters; stop-watch; meteorological instruments; drafting instruments; mechanical calculators; blue print apparatus; a four and one-fourth inch astronomical telescope with equatorial mountings and accessories; celestial sphere, etc.

In addition to the large number of technical books and periodicals contained in the general library, this department possesses a considerable number of valuable reference works concerning its special lines of investigation.

MINING AND METALLURGY.

The Department of Mining and Metallurgy is well equipped for giving both theoretical and practical instruction in the arts of mining, metallurgy, and assaying in all its branches.

Attached to the main building is an annex or mill, con-

taining machinery and appliances for crushing, sampling, concentrating, amalgamating, leaching, chloriding, cyaniding and the electrical treatment of various kinds of ore in large or small lots. Power is furnished from a seventy horse-power boiler, detached from the main building, the steam being carried under-ground to the engine-room, which contains a thirty-five horse-power engine, built by the Walburn-Swenson Manufacturing Co., of Fort Scott, Kan., and a sixteen horse-power Westinghouse automatic engine, the latter being used for running the dynamo.

The mill building has a storage capacity for ore of fifty to one hundred tons. From the bins the ore passes to the crushing floor above. A seven inch by ten inch Blake crusher is used for coarse crushing, and a Dodge crusher for finer work. Beneath the Blake crusher is a set of fourteen-inch by twenty-inch Cornish rolls, from which the ore passes by a conveyor to the main elevator, which carries it up thirty-one feet to the top of the mill. By means of slides and chutes the crushed ore may be sent at will to various machines to be tested by different methods. For concentration there are provided revolving sizing screens giving facilities for preparing six sizes, besides hydraulic separators for classifying slimes into three grades. The coarser sizes may be worked upon full sized jigging machines of the Hartz pattern, the finer sizes being jigged upon slide motion machines, and the slime being worked upon a double Rittinger percussion table, or otherwise as desired. A small apparatus, run by an electric motor, is also provided for dry concentration. Amalgamation tests may be made upon a working scale by different methods, including plates and riffles, pans and settlers, etc. A five stamp gold mill with silvered plates and aprons of the latest and most approved construction, by Fraser & Chalmers, of Chicago, has recently been added to the mill, thus permitting the working of free-milling gold ores by the usual methods and on a large scale. Several lots of ore have been successfully worked and returns made in gold bullion, thus familiarizing the mining students with all the details of feeding, stamping, cleaning up, retorting, smelting, and assaying.

In addition to the five stamp mill a smaller prospecting mill of three stamps has been added so as to work small lots

of ore from 100 to 200 pounds. A sampling mill permits of rapid crushing and mixing large samples preparatory to assaying.

Above the engine room is a seventy-five light Mather incandescent dynamo, from which six circuits are distributed to different parts of the University building. Of these, two circuits are for lighting purposes; one extends to the hoisting motor; another to the motor which runs the concentrating machinery; another circuit to the fan motors used for ventilating purposes; and the sixth goes to the storage batteries which provide current for electrolytic work in the assay laboratory.

The assay laboratory is equipped with assay furnaces for crucible work, for scorifying and cupelling, and for retorting mercury from amalgam. An adjoining room, supplied with water, gas and electric current, has a roomy hood for work involving fumes, with tables and desks for student work, besides all needed appliances for assaying by dry and wet methods including electrolysis.

The laboratory also has desks and fittings for the chemical work required in the metallurgical and mineralogical investigation and analysis of ores, mineral fertilizers and qualitative tests of minerals.

MECHANICAL ENGINEERING AND PHYSICS.

Three large rooms in the basement of the main building are set apart for the teaching of physics.

The facilities for experimental demonstration of all important phenomena are very complete. The lecture room is fitted with shutters, so that it can be instantly darkened. A beam of sunlight, directed by a very fine clock heliostat outside, may be thrown steadily across the lecture table for experiments on light, or used in connection with the solar lantern for a variety of other work. The lecture table is supplied with gas, water, electric currents from primary and storage batteries, and from the large dynamo.

Adjacent to the lecture room is the apparatus room where are kept the many instruments owned by the University,

among which may be mentioned: An Atwood's machine; Kater's pendulum; whirling table; many balances; barometers; an air pump and accessories; a hand dynamo; a 75-light Mather dynamo (not in apparatus room); motors; six storage cells; a large number of primary batteries; induction coils; Deprez-D'Arsonval tangent, and sine galvanometers; rheostats; Wheatstone's bridges; a fine testing set; a Wimshurst electric machine; Leyden jars; Geisslers and Crooke's tubes; diapasons; a sonometer; lenses, prisms, and mirrors of all kinds; a polariscope; steam gauges; indicators; calorimeters; and other apparatus, costing in all over \$3,000.

Both these rooms open into the large physical laboratory, where the students verify for themselves the laws set forth in text-books and lectures.

REQUIREMENTS FOR ADMISSION, ETC.

Applicants for admission to any department of the University will be required to furnish satisfactory evidence of good moral character, and of honorable dismissal from the schools with which they were last connected.

For admission to the freshman class, applicants must be at least sixteen years of age and must pass satisfactorily examinations in subjects sufficient to give nine credits as described below. One study pursued satisfactorily for one year, one period a day, as ordinarily taught in high schools entitles a student to one credit. The subjects upon which examinations must be passed and the credits assigned, are:

Mathematics, including arithmetic, algebra, and plane geometry—3 credits.

English—2 credits.

History and Civics—1 credit.

Elementary Science—1 credit.

Latin, German, or French—1 credit.

Advanced Science—1 credit.

The scope of work required in the various subjects is indicated below.

MATHEMATICS—Arithmetic, entire, including the metric

system; Algebra, through quadratic equations, including factoring, the greatest common divisor, and the least common multiple, as treated by Wentworth or Wells; Geometry, all of plane. (Wentworth or Wells.)

ENGLISH—A competent knowledge of the elements of English grammar, composition, the elements of rhetoric, and the following English classics or acceptable equivalents: Longfellow's *Evangeline*; Irving's *Sketch Book*; Scott's *Ivanhoe* and *Lady of the Lake*; Whittier's *Snow-Bound*; Shakspeare's *Julius Caesar* and *Merchant of Venice*; George Eliot's *Silas Marner*.

HISTORY—Ancient, Mediaeval and Modern. (The text book in use in the preparatory department is Meyers' *General History*.) United States History and the Science of Government.

ELEMENTARY SCIENCE—Geography, political and physical, as included in "Frye's *Complete Geography*;" Physics, as much as is contained in "Gage's *Introduction to Physical Science*." Note books covering such laboratory work as has been performed by the student should be presented for examination.

LATIN—As comprehended in "Collar & Daniells' *Beginner's Latin Book*" or an equivalent.

ADVANCED SCIENCE—One year's creditable work in biological science, or chemistry, or physics, at least one-half of which has been laboratory work, the quality and scope of which must be shown by the original laboratory note books.

Beginning with September, 1898, the entrance requirements will be increased to twelve credits, including:

Latin or German or French or Advanced Science—2 credits.

Drawing and Manual Training, or additional text-book subjects—3 credits.

If any language is offered it must be to the extent of two credits, as a single year's study of a language is not considered to have sufficient educational value to be entitled to credit.

Students from other institutions of equivalent rank may be admitted to the higher classes upon the presentation of properly authenticated certificates, showing clearly to the satisfaction of the faculty that they are qualified to proceed with such work.

Arrangements have been made with the Arizona Territorial Normal School, at Tempe, whereby students from that institution may have their record transferred to the books of the University with full credit, upon presentation of a certificate duly signed by the principal. Students of this University may also obtain the equivalent privilege at the normal school by presenting the proper certificate of standing signed by the president.

The faculty desires to establish such relations with high schools and other educational institutions as will enable it to accept their certificates without question. To this end presiding officers are respectfully requested to correspond with the president.

REGISTRATION OF STUDENTS.

All students are required to register on registration day at the beginning of the year in the president's office. A matriculation fee of \$5.00 is required of all students. Each will receive a card indicating the classes which he or she is to attend, and a receipt for the matriculation fee, when paid. No class card will be issued until all dues are paid. No change in registration can be made without the consent of the faculty.

Permission of the faculty is necessary to register at any time after registration day.

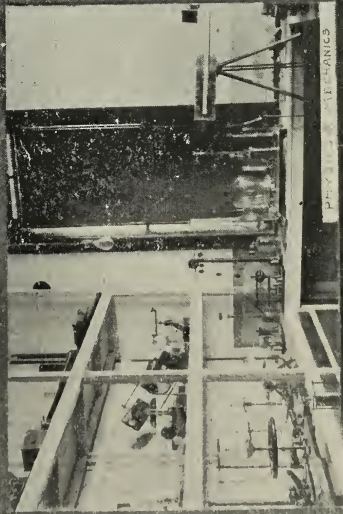
No student shall be permitted to register in the spring term of the senior year as a candidate for a degree who has not previously made up all failures and "conditions" in subjects required for the degree.

TERM RECORDS.

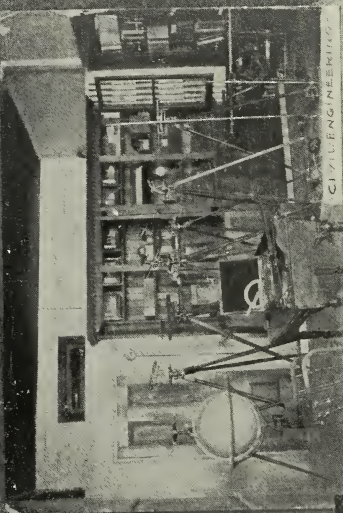
The class standing of each student is determined by the instructor in charge. The method of ascertaining the student's term record is left to the instructor, and his report in all cases is final.

MONTHLY REPORTS OF STUDENTS.

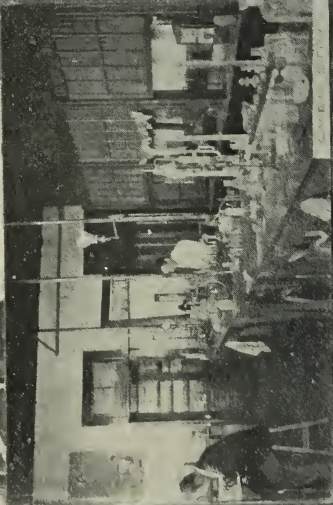
Reports of standing in classes are regularly sent each month to parents and guardians from the president's office. Those to whom these reports are addressed are urgently requested to examine each with care and to spur up delinquent students, or commend those who are diligent, as the case may



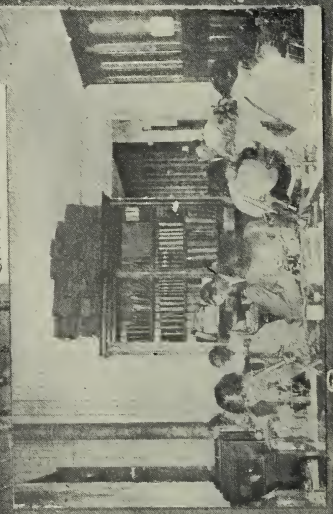
MECHANICS



CIVIL ENGINEERING



MECHANICS



CLASS ROOMS

be. Without such hearty co-operation, good results cannot be anticipated.

FACULTY MEETINGS.

Regular meetings of the faculty are held weekly.

Students' individual petitions must be in the hands of the president before the hour of faculty meeting in order to receive attention the same week. Petitions from classes, or from any two or more students will not be acted upon by the faculty unless presented in writing to the president at least two days before the meeting at which action is desired.

DISCIPLINE.

It is understood that students enter the institution with serious purposes and that they will cheerfully conform to such regulations as may be made by the faculty. It is the aim of the faculty to maintain a high standing of integrity and a strict regard for truth. Any attempt on the part of a student to present as his own the work of another, or to pass any test or examination by unfair means is considered a most serious offense. Any conduct harmful to the moral standing of the school will, after due admonition, render a student liable to dismissal.

THE HUGO ZECKENDORF PRIZES.

A gold medal and a silver medal have been offered as prizes by Mr. Hugo Zeckendorf, of Tucson, on the following conditions:

1.—The Senior student who presents the best essay upon some subject relating to the duties of citizenship, will be awarded the gold medal.

2.—The student who maintains the best class record throughout the Junior year will be awarded the silver medal.

Both awards are subject to the regulations of the University Faculty.

The awards of these prizes on Commencement Day, 1897, were:

The Gold Medal, for the best Senior essay, to Mark Walker Jr., of Tucson.

The silver Medal, for best Junior record, to Granville Malcom Gillett, of Phoenix.

VACATIONS, ACCOMMODATIONS, ETC.

VACATIONS AND HOLIDAYS.

Short vacations (as per Calendar on page 3) are taken at Christmas and Easter. The long summer vacation begins about June 1st and continues until near the close of September.

All legal holidays are observed by the cessation of ordinary University work, and the Thanksgiving recess extends from the close of regular exercises on the preceding Wednesday until the Monday morning following.

Appropriate exercises may be arranged by the Faculty for any of the legal holidays, in which the students will be expected to join, if required.

Arbor day has been formally adopted by the University Faculty as the regular anniversary, on which shall be celebrated the founding of the institution, in connection with the ceremonies of tree planting.

LIVING ACCOMMODATIONS AND EXPENSES.

Provision is made as far as possible for furnishing board and rooms for students, of both sexes, upon the University grounds.

Young men have excellent quarters in the new dormitory building.

A separate home for young ladies is in charge of Mrs. Imogen LaChance, an experienced and capable matron, who as last year, will have constant supervision of those rooming in "ladies' hall."

There is no charge for tuition in the University. All students are required to pay once only, (upon entrance) a matriculation fee of five dollars.

Charges will be made for material actually consumed by students in the laboratories.

The expense for board and room rent will amount to about \$15.00 per month. By resolution of the Board of Regents of the University, board is to be paid in advance at the beginning of each term. Checks, P. O. or Express Money Orders should be made payable to the President. No reduction will be made for absence for a period of less than one week.

Students will be provided with simple furniture, including single bedstead, mirror, wash-bowl, pitcher, and slop jar. They will supply their own mattress, pillow, bed clothing, towels, etc. They will care for their own rooms, and the halls, staircases, and study rooms of their respective dormitories under the direction of the person in charge.

Text-books required are obtained direct from the publishers through a book association managed on the co-operative plan under the direction of the Faculty, and may vary in cost between five and ten dollars in different years of the course.

Economical students should readily go through the year with \$150.00 to \$160.00, excluding clothing.

Members of the battalion will be required to provide themselves with the prescribed uniform. During the past year the cost of uniform with cap, and including transportation charges, has been \$14.90. This uniform has shown better wearing qualities than a civilian suit of equal cost, and parents are urged to consider the matter of uniform when supplying their sons with clothing for the approaching school year. It may be worn on all occasions, and thus will remove the necessity for the usual expenditures for outer clothing other than overcoats.

Provision has been made for the self-support of students to a limited extent.

LITERARY SOCIETY.

The Philomathean Society, an organization of students open to all, holds its meetings in the assembly room of the University. Its work embraces general literary exercises and parliamentary usage, and is a valuable adjunct to the regular college course.

ATHLETICS.

Encouragement is given to athletics and athletic organizations are under the immediate care of a committee of the faculty. Membership in these organizations is subject to forfeiture for failure in any regular line of school work.

MILITARY TRAINING.

Appreciating the importance of military drill as a physi-

cal exercise and as an aid to discipline, provision has been made for a course in military science and tactics.

Military drill is required of all male students throughout the preparatory course and as far as the end of the sophomore year, unless excused by the faculty for sufficient cause, and is optional through the remaining years. Students claiming exemption from drill by reason of physical disability will be required to secure from a physician designated by the faculty, a certificate of incapacity, except when the disability is apparent. In general the officers and non-commissioned officers will be chosen from the higher classes, scholarship as well as proficiency in drill being considered in making promotions.

Each member of the military organization will be required to provide himself with the prescribed uniform within six weeks after his entrance. The uniform consists of cap, coat and trousers of cadet gray cloth trimmed with black braid and closely resembles the undress uniform of the U. S. Military Academy at West Point. Black shoes and white cotton gloves are also required. A uniform vest is prescribed. The purchase of this garment is optional as it is not required to be worn unless the coat is worn unbuttoned. A committee of the faculty will protect the interests of students by inspecting all uniforms as received from the makers in order to secure good materials and workmanship at a minimum cost.

An equivalent of the time occupied in military drill will be devoted by female students to physical culture, vocal culture, and instruction in the rudiments of hospital practice and prompt relief of the injured.

COURSES OF INSTRUCTION.

The facilities and privileges of the University are open to all qualified persons of either sex without charge.

Three regular four-year courses of study leading to a degree are offered, viz:

Literary and Scientific.

Engineering and Mining.

Agriculture.

In each course the work is partly required and partly elective as shown in schedules later. Four hours of recitation a day are required in each course as full work. In laboratory work two to two and one-half hours are considered the equivalent of one recitation hour.

Persons of mature age and with sufficient preparation who are not candidates for a degree will in some cases be admitted to regular classes as special students, without having taken the required work of the lower years of the course; provided, however, that in all such cases they show to the satisfaction of the instructor giving the course that they can take the work with profit to themselves and without detriment to the work of the regular class.

Work is offered in the following lines: English language and literature, Latin, Spanish, French, German, history and civics, mathematics, physics, chemistry, biology, mineralogy and geology, drawing and shop work, engineering, mining.

The exact scope and nature of the various courses are shown in detail later.

Students, who have completed satisfactorily the required work and the specified amount of elective work in either of the four year courses, during will be given the degree of Bachelor of Science. (B. S.)

Each candidate for graduation is required to present an acceptable thesis embodying the results of a special and thorough study of some subject within the range of the course pursued. The subject of the thesis must be submitted for the approval of the faculty not later than the opening of the second term of the senior year, and the completed thesis must be presented not later than three weeks before commencement day.

The advanced degrees of Master of Science and Master of Arts are conferred upon Bachelors, graduates from this University or from institutions of equivalent grade, who have successfully pursued a course of study marked out by the faculty and requiring not less than one year.

The degrees of Civil Engineer, Mining Engineer, Irrigation Engineer and Electrical Engineer are open to graduates properly prepared, who have pursued special lines of post graduate work in accordance with faculty regulations.

COURSES OF STUDY 1898-99.

Literary and Scientific.

Engineering and Mining.

FRESHMAN YEAR.

Required—
 English. 19th Century Prose
 Elective—
 Solid Geometry, Trigonometry,
 Higher Algebra,
 Latin.
 French.
 German.
 History.
 Drawing.

Required—
 English. 19th Century Prose.
 Solid Geometry, Trigonometry,
 Higher Algebra.
 Drawing and Shopwork.
 Elective—
 French.
 German.
 Spanish.
 History.

SOPHOMORE YEAR.

Required—
 English.
 Elective—
 Higher Alg., Analytic Geom.
 Latin.
 French.
 General Chemistry } Qual. Anal.
 or Botany.

Required—
 Higher Alg., Analytic Geom.
 Surveying.
 Elective—
 Chemistry.
 French.
 German.
 Spanish.
 Instrumental Drawing.

JUNIOR YEAR.

Elective—
 English.
 Calculus.
 History.
 * Political Economy and Civics.
 * Physics.
 Botany.
 Anatomy and Physiology.
 Zoology.
 Mineralogy.

Required—
 Calculus.
 * Physics.
 Elective—
 Mineralogy, Assaying.
 Quantitative Analysis.
 History.
 * Political Economy and Civics.
 Advanced Mechanical Draw-
 ing.

SENIOR YEAR.

Elective—
 * Psychology, History of Educa-
 tion, Pedagogy.
 Geology, Astronomy.
 History.
 Logic, Ethics.
 And other electives not prev-
 iously taken.

Required—
 Analytic Mechanics.
 Geology.
 Elective—
 Metallurgy and Assaying.
 And other electives not prev-
 iously taken.

It is the present policy of the faculty to give some of the advanced courses only once in two years. By this means a greater variety of courses can be offered by the limited number of members of the faculty and still give every student an opportunity to take all those which he desires. The courses marked with a star in the table have been given in the year 1897-98, and will probably not be given in 1898-99. Classes beginning French and German will be formed in alternate years.

AGRICULTURAL COURSE.

FRESHMAN YEAR—English, Solid Geometry, Trigonometry, Higher Algebra, Modern Language, Shopwork and drawing.

SOPHOMORE YEAR—Higher Algebra, Analytic Geometry, Meteorology, Chemistry, Surveying, Botany, Drawing, Farm Equipment, Soils and Irrigation.

JUNIOR YEAR—Farm Crops, Breeds of Live Stock, Botany. Anatomy, Zoology, Entomology, Floriculture, Landscape Gardening, Forestry, Horticulture.

SENIOR YEAR—Stock Breeding and Feeding, Dairying, Veterinary Medicine, Geology, Fruits and Fruit Culture, Vegetables and Vegetable Culture.

EXPLANATORY OF COURSES OF STUDY.

ENGLISH.—*Prof. Hall.*

The object of the work in English is, first, to promote a taste for literature as a means of pleasure and of culture, and secondly, by means of the study of eminent authors to cultivate a correct standard of literary judgment and taste. With these objects in view the method of work is intensive rather than extensive. A few authors are chosen for careful study, and sufficient time is spent upon these to acquire accurate ideas of their individual merits and style.

FRESHMAN YEAR—Prose writers of the 19th century, especially DeQuincey, Macaulay, Carlyle; English classics.

SOPHOMORE YEAR—Advanced rhetoric and rhetorical analysis, argumentative and expository composition; Burke, Webster; in the spring term Elizabethan literature; Lowell.

JUNIOR YEAR—Shakespeare; early 19th century poets; Tennyson, Milton.

RHETORICALS—The appearance once during each term in public rhetorical exercises, suited to their position in the course, is required of all students taking courses leading to a degree and of students taking English or Elocution, unless excused by vote of the faculty. Deficiency in rhetorical is ranked as a deficiency in any other subject; failure to appear on date assigned is regarded as total failure.

LATIN—*Prof. Adams.*

The aim of the work in Latin will be to produce in the student the ability to read the original with an appreciation of its meaning and beauty without conscious translation into the vernacular. Incidentally and of no less value, it is expected that his power of observation, mental ability, and knowledge of the use of English will be greatly strengthened. The instruction throughout the course will be shaped with the above ends in view. The laboratory method will be used in part, giving to each pupil the opportunity of doing as much work as his strength and knowledge of the subject will allow.

FIRST YEAR—Special attention will be given to vocabularies; an accurate knowledge of all inflectional forms will be insisted upon, and the student will be led to investigate and discover the underlying laws and principles on which these are based. Attention will be paid to the Latin sentence structure, and the comparison of this with English sentence structure, and in translation from Latin to English, idiomatic English will be insisted upon, while in translation from English into Latin, attention will be called to the English grammatical structure and its comparison with the Latin. In the latter part of the year easy Latin, like *Viri Romae*, will be read. Text-book: Collar's First Latin Book.

SECOND YEAR—An introduction to the study of Roman

literature. Selections from Caesar, the Lives of Nepos, and similar Latin will be read with much sight reading. The text will be studied critically with translation into idiomatic English. Prose composition will be continued throughout the year with incidental study of history and geography. Text-books: Allen and Greenough's Grammar and texts; Daniell's or Bennett's Prose Composition.

THIRD YEAR—Cicero's Orations and Vergil's Aeneid will be read. While the same principles will govern the work as in the second year, more attention will be paid to sight reading and to the reading of the original with an appreciation of its meaning in the same way that English is read. In connection with the reading of Cicero a thorough study will be made of the Roman system of government and the customs and occupations of the people. In connection with the Aeneid a similar study will be made of Latin poetry and the expansion of the hexameter, also of the religious rites and beliefs of the ancients together with the principal mythological characters. Throughout the course attention will be paid to word study and English derivatives of Latin words.

FRENCH AND GERMAN.—*Prof. Adams.*

The work in the modern languages will in general have the same end in view as that in Latin, and will be made an exact equivalent for the work in Latin as far as possible.

FIRST YEAR—Careful attention will be given to fixing correct habits of pronunciation together with thorough drill in forms and syntax. Constant attention will be paid to translation at sight and at hearing, and to some extent to conversation. Text-books: French; Sym's First Year in French, Super's French Reader, Heath's Texts. German; Collar's Shorter Eysenbach, Joynes Meissner's German Grammar, Harris' German Composition, Heath's texts.

SECOND YEAR—French: Standard prose will be read, selections being taken from Dumas, Hugo, and Moliere, together with sight translations and composition. As far as possible French will be made the language of the class room. German: The same general plan will be followed. Standard prose and a play of Schiller will be read, German being the language of the class room.

SPANISH.—*Mrs. Aguirre.*

A thorough course of instruction in Spanish grammar and in reading, writing, and speaking the language.

HISTORY, CIVICS AND PHILOSOPHY.

PSYCHOLOGY—*First Semester*—Lectures, recitations, and collateral reading, with special consideration of the subject as applied to teaching. Text-book: James Briefer Course.

—*Prof. Woodward.*

HISTORY OF EDUCATION—PEDAGOGY—*Second Semester*—Lectures giving a brief but comprehensive outline of the school system of ancient, mediaeval, and modern countries, with special study of leading educators, such as Socrates, Comenius, Pestalozzi, Froebel, Mann, etc. The course will also cover the present trend of pedagogical thought and practice.

—*Prof. Adams.*

MATHEMATICS.—*Prof. Woodward.*

It is the aim of the work in mathematics to train the student to the habit of logical and vigorous courses of reasoning, to show the wonderful breadth of application of higher mathematics, to display the beauties and pleasures of the demonstrations, methods, and results of higher geometry and calculus, and to give such practice in the use of these agents as will enable students who pursue the higher branches of engineering to use them naturally and easily in those multitudinous applications where they are indispensable. The courses in mathematics depend upon each other to such an extent that they can be taken only in the order in which they are printed.

SOLID GEOMETRY—One-third freshman year. Text-book: Phillip's and Fisher's Elements of Geometry.

TRIGONOMETRY—One-third freshman year. Text-book: Well's Essentials of Trigonometry.

HIGHER ALGEBRA—Two-thirds year in freshman and sophomore years. Text-book: Wentworth's College Algebra.

ANALYTIC GEOMETRY—Two-thirds sophomore year. Text-book: Bowser's Analytic Geometry.

CALCULUS—Junior Year. Lectures and recitations covering differential and integral calculus, with special reference to their use in higher branches of engineering. Some notice is also taken of the modern branches of higher mathematics which are led up to and investigated by means of the calculus. Text-book: Bowser's Calculus.

CHEMISTRY.—*Prof. Forbes.*

The instruction in chemistry has two main objects in view—first, to promote general culture; and second, to introduce students to technical work, especially in mining. The first year's work in general chemistry and qualitative analysis places the student in an advantageous position to take up the study of mining and metallurgy.

GENERAL CHEMISTRY—*First Semester—Sophomore Year.* The subject is introduced by a course of lectures and experiments by the instructor, and this is supplemented by recitations and laboratory practice. Emphasis is laid on the laboratory work, and special effort is made to secure its full value both as a source of information and as a means of training students in habits of careful observation and skillful manipulation. Text-book: Remsen's Briefer Course.

QUALITATIVE ANALYSIS—*Second Semester—Sophomore Year*—This subject is pursued with careful attention both to the principles of the science and to its technical execution. At the end of the course a fairly bright student is expected to be able to determine the composition of any unknown substance submitted to him for examination. Text-book: Eliot and Storer's Qualitative Analysis, and various reference books.

QUANTITATIVE ANALYSIS—*Junior Year*—This course has technical value in connection with the mining and metallurgical courses besides training the student in habits of thorough and accurate work.

PHYSICS.—*Prof. Woodward.*

PHYSICS—*Junior Year*—Lectures, recitations, and laboratory work. A knowledge of trigonometry is necessary for this course. Text-books: Hall and Bergen's Physics, Ames' Theory of Physics.

BIOLOGY.—*Prof. Toumey.*

In addition to the elementary work provided in the preparatory course, as elsewhere stated, this department offers two lines of work, viz: botany and zoology.

BOTANY.—The work in botany covers one and one-half years. The preparation for this work consists of the course in elementary biology given in the preparatory department, or its equivalent. The work is of elementary character, covering in a general way the histology, physiology, morphology, and systematic relationships of the more important types of plant life. The instruction is in the form of laboratory work with occasional lectures covering the subjects under investigation. Bessey's Botany, advanced course, is used as a text-book, supplemented by the following as necessary reference books: Gray's Structural Botany, Sach's Physiology of Plants; Goebel's Outlines of Classification and Special Morphology. The botanical library contains the more important literature bearing upon the systematic botany of this region.

ZOOLOGY.—The work in zoology covers one year. In this work attention is given to the principles of classification, the structure and development and the comparative anatomy of types of animal life. Considerable time is occupied in laboratory work, making dissections and in microscopical study of animal histology. Orton's Comparative Zoology is the text-book in use.

One full course is given in human anatomy and physiology. That this subject may be represented in a creditable manner the laboratory is provided with articulate and disarticulate human skeletons, casts representing the vital organs and numerous charts. Martin's Human Body, advanced course, is used as a text book, the daily recitations being supplemented by lectures and laboratory investigations.

In addition to the course as given above, this department offers facilities for more advanced work or original research in botany to those qualified to pursue the same.

MINERALOGY AND GEOLOGY.

MINERALOGY AND ASSAYING.

Junior Year.

A year's course of lectures, recitations, and laboratory

work covering (a) crystallography, (b) blow-pipe analysis and determinative mineralogy, and (c) fire assaying. At the end of the course the student is expected to know at sight all the common ores and minerals, and to be able to determine and classify, by the use of the blow-pipe and a few simple reagents, any less common mineral he may meet. A study is also made of the occurrence, uses, and distinctive characters of the most important minerals.

—Prof. Guild.

METALLURGY AND ASSAYING—Senior Year. This work is intended to fit the student to accurately make determinations of gold, silver, and lead in bullion, ores, and furnace products, by the furnace method, and to become familiar with the standard methods used in this country for the determination of all the metals of economic metallurgical importance. The course also includes instruction in the complete analysis of alloys, ores, slags, mattes, etc. The text-books required are Fresenius' Quantitative Analysis or some similar standard work, and Furman's Manual of Practical Assaying.

—Prof. Guild.

GEOLOGY—Senior Year. Lectures, recitations, and examination of specimens from the large collections in the museum, covering the subjects of dynamic, historical, and economic geology. Text and reference books: Dana, Le Conte, Geikie.

—Prof. Blake.

DRAWING AND SHOP-WORK.

FREE-HAND DRAWING—Throughout Freshman Year. Drawing from copies, from geometrical models, perspective, shading and machine sketching.

INSTRUMENTAL DRAWING—Sophomore Year. Linear drawing, lettering, shading, machine drawing, tracing and blue-printing.

ADVANCED INSTRUMENTAL DRAWING. Junior Year.

(a) Descriptive Geometry. Lectures, recitations, and drawing. Must be preceded by free-hand and instrumental drawing.

(b) Graphical Statics. Lectures, recitations, and drawing. Simple roof and bridge trusses considered with dead, moving, wind, and snow load.

(c) Kinematics. Lectures, recitations, and drawing. Curves, cams, gear teeth, and various machine motions will be treated.

SHOPWORK. Practice in joinery, wood turning, and iron work.

SPECIAL COURSES.

In addition to the foregoing regular courses the special courses enumerated below have been established by the Board of Regents in response to the demand for them.

COMMERCIAL COURSE—*Mr. Mendenhall.*

A one year's course in business arithmetic, book-keeping stenography, typewriting, penmanship, and commercial law designed to prepare students for actual commercial life.

SHORT COURSE OF INSTRUCTION IN ASSAYING AND MINING

In order to meet the needs of many young men who are desirous of learning the art of assaying the common ores and metals, and who are not able to give the time required in the full course of study for graduation and the degree of mining engineer, the Board of Regent has approved of a short course of instruction in practical assaying, metallurgy, etc., to be given in the laboratories and mill.

This course commences with the first college term in each year and requires at least one year of time, but students are advised to give two years or more to the work, of which in one year they cannot expect to gain more than the rudiments and outlines.

The lectures in the regular courses of study upon chemistry, mineralogy, geology and metallurgy, are open to deserving students in the special short course.

REQUIREMENTS FOR ADMISSION.

Young men desiring to take this course are required to be at least eighteen years of age, to have good health, and to have a sufficient knowledge of English and arithmetic. They must agree to observe the rules and regulations of the University.

Instruction is gratuitous, but each student is required to pay the regular entrance or matriculation fee of five dollars and to pay the cost of materials, glassware, and apparatus.

used by him. For this purpose a deposit of ten dollars will be required each term in advance, and any balance will be refunded.

If for good reasons students are unable to enter at the commencement of the year, they may be received at a later date, at the discretion of the director, upon passing a satisfactory examination upon the studies already passed over by the other students in the course.

COURSE OF STUDY.

SEPTEMBER TO JANUARY.

ELEMENTARY CHEMISTRY—The elements; their symbols, combining numbers, their nature and properties. Nature and properties of reagents used.

FIRE ASSAYING—Furnace, apparatus, materials, and manipulation. Work in laboratory.

BLOWPIPE PRACTICE—Manipulation. Tests of simple substances, metals and fluxes.

MINERALOGY—Lectures and work in the laboratory.

GEOLOGY—Lectures on structural and historical geology.

JANUARY TO MARCH.

SAMPLING ORES AND MINES—(Mill.)

WET ASSAYING.

DETERMINATIVE MINERALOGY.

GEOLOGY—Prospecting and testing. Mineral deposits.

MARCH TO JUNE.

MINING—Sinking, driving, stoping, hoisting.

MILL WORK—Crushing, stamping, amalgamating, etc.

METALLURGY—Melting and refining bullion; processes for the extraction of gold and silver.

ELECTROLYSIS—Assaying by electricity. Deposition of metals.

GEOLOGY—Mineral veins and ore deposits.

TEXT-BOOKS.

The following text-books and others are used:

Assaying—Ricketts, Brown, Furman, Aaron.

Mineralogy—Dana, Brush's Determinative Mineralogy; Dana's How to Study Minerals.

Geology—Dana, Le Conte, Geikie.

PREPARATORY COURSE.

The preparatory course, occupying three years, has been especially designed for those who have not had sufficient training to enter the classes of the freshman year.

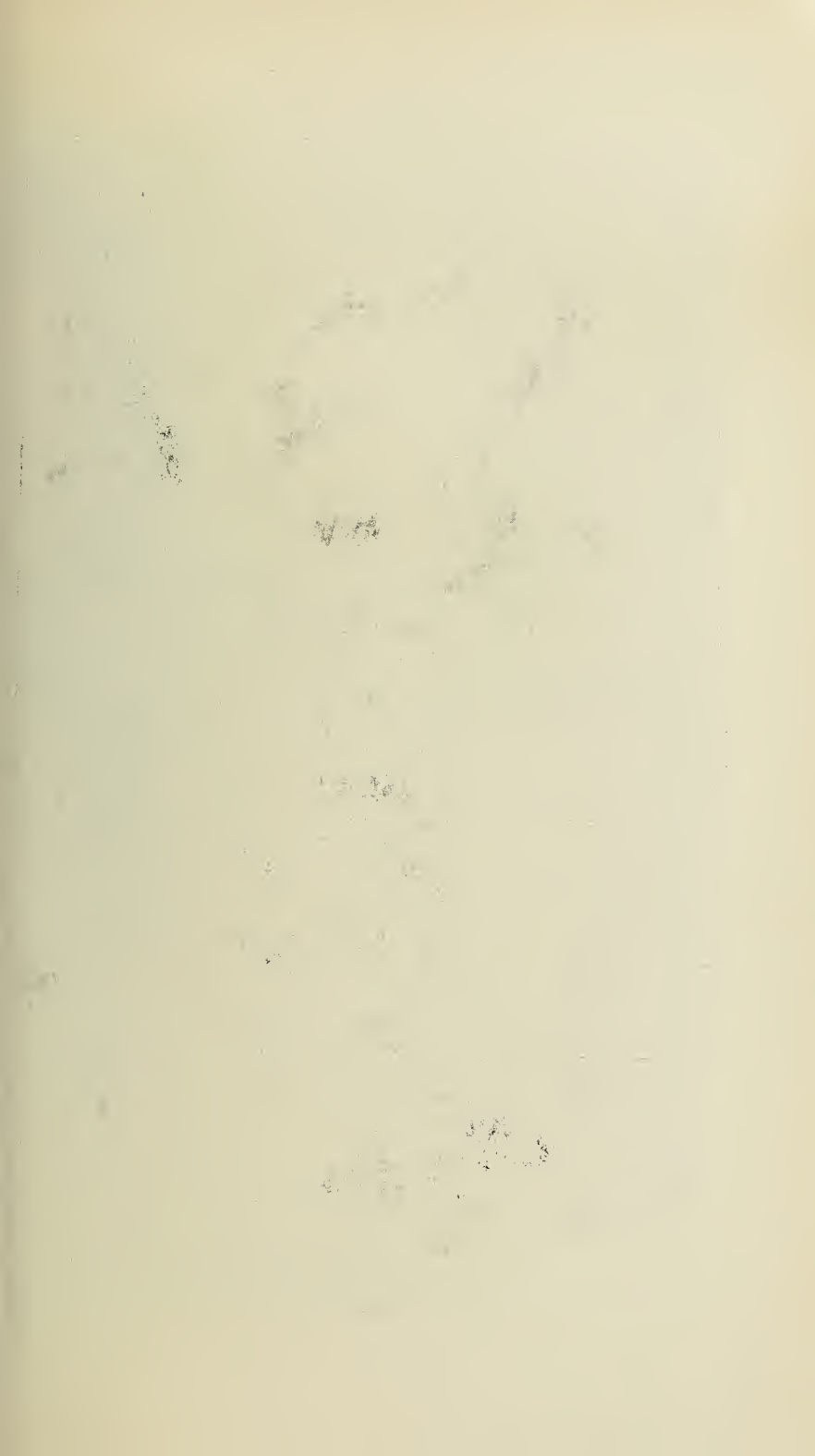
It is not the desire of the faculty to engage in any work which can as well be done in the public schools of the territory, but we have found it impracticable to dispense with classes designed to prepare students for the work of the higher classes. This course affords thorough training, as far as it goes, and provides a good foundation for future studies. One of its main objects is to give training in the best methods of study, to teach pupils to think. In many cases, students lacking neither in zeal, nor ability, are at a disadvantage in not knowing how best to direct their energies to the matter in hand. It will be the constant aim of the instructors in the preparatory school to overcome this difficulty, which has heretofore been the most serious hinderance to educational progress.

To each student who completes the studies of the preparatory course, a certificate stating that fact will given, which certificate will entitle the holder to admittance to the higher courses of the University without examination.

Preparatory Course of Study.

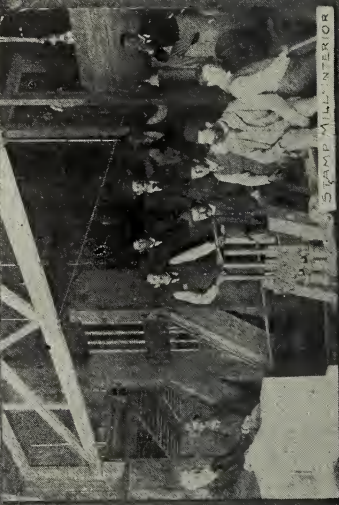
Numerals indicate number of recitations per week.

FIRST YEAR.		SECOND YEAR.		THIRD YEAR.	
Algebra	5	Algebra	5	Geometry	5
English	5	English	2	English	3
Elementary Science	5	History	3	Civics	2
Drawing	4	Latin,	} ——— 5	Latin,	} ——— 5
Shopwork	6	German,		German,	
		French,		French, or	
		Biology, or		Physics	
		Chemistry		Drawing	4
		Drawing	4	Shopwork	6
		Shopwork	6		

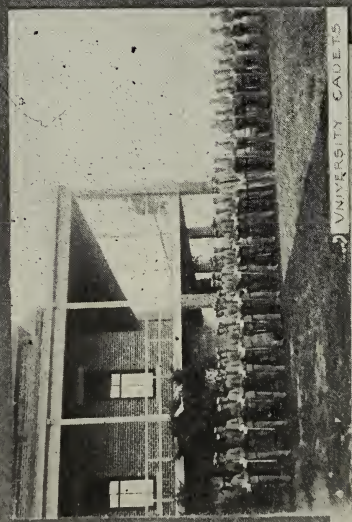




STAMP MILL



STAMP MILL INTERIOR



UNIVERSITY CAUETS



GREENHOUSE

AGRICULTURAL EXPERIMENT STATION.

STATION STAFF.

MILLARD M. PARKER	President
JAMES W. TOUMEY, Acting Director.....	Botanist
ROBERT H. FORBES.....	Chemist
NATHAN H. BARNES.....	Irrigation Engineer and Meteorologist
A. J. McCLATCHIE.....	Agriculturist and Horticulturist

MARK WHLKER, Jr.....	Assistant Chemist
LEE LACHANCE	Stenographer
BEN EAGER.....	Foreman Phoenix Station

ESTABLISHMENT AND OBJECT.

The Agricultural Experiment Station is established according to an Act of Congress, and by the Territorial Legislature has been made a part of the University.

The function of the station is to aid in developing the agricultural and horticultural resources of the Territory, by solving as completely and rapidly as possible some of the complex problems with which the farmers, fruit growers and stock raisers are confronted. In aid of this the national government has appropriated the sum of \$15,000 to be paid annually to the Board of Regents for this specific purpose.

The lines along which the work of the station runs, embrace the investigations of the conditions of climate, soil, and water supply in the various parts of Arizona, and the adaptability of the conditions found to the growth of different agricultural and horticultural crops; the range of climate suited to the production of these crops; the maximum, minimum, and mean amount of water; the successful cultivation of dif-

ferent farm and garden crops; water storage and the development of water from other sources; the best means of applying water; methods of culture; the best season for planting; breeds of farm animals and their improvement to meet local conditions; the introduction of new fruits, vegetables and farm crops, and the distribution of plants and seeds; the development of forest tree culture; the investigation of diseases affecting the plants and animals of the territory, and the remedies best suited to prevent or eradicate them; the publication of bulletins upon investigations undertaken, and the results obtained. These bulletins are issued periodically and sent free to all who apply for them. The range of the work of the station is only limited by the needs of the territory, and the funds available for use in making the investigations. Those questions which are thought to be of greatest importance to the territory come first in the line of work pursued.

To further the ends of the station in extending its usefulness, the co-operation of all interested in its work is earnestly solicited. Suggestions will be gratefully received and inquiries answered cheerfully, wherever possible, by the members of the staff, each for his own department. No charge is made for answering these questions, and when qualitative chemical analyses or other investigations, of general public interest and benefit are requested, they will be undertaken if possible, and without cost. For quantitative analysis, involving more labor and expense, a small charge is made.

The location of the experiment station at the University is of great benefit, directly and indirectly, to the students in the University. The specialists in the station work are available as professors in their respective branches in the University, thus affording a larger corps of teachers specially equipped in the several departments. The station investigations also provide opportunities to students in agriculture and other special branches, for the study of special conditions and methods of peculiar interest to the territory, which would not otherwise be available.

All communications respecting station matters should be addressed to:

*DIRECTOR EXPERIMENT STATION,
Tucson, Arizona*

THE ARIZONA SCHOOL OF MINES.

In addition to the facilities for general instruction in the arts of mining, metallurgy and assaying, this department of the University is provided with a mill for working ores in large or small quantities from a few pounds weight to a ton or more. Mill tests can be made by either the small three stamp mill, or by the large five stamp battery. There are rolls for roller crushing, and jigs and Rittinger tables for concentrating ores.

QUALITATIVE EXAMINATIONS.

In order to promote knowledge of the mineral wealth of Arizona and to disseminate accurate information regarding the minerals and rock formations, and their distribution, qualitative tests or determinations of the nature of mineral substances not requiring an assay, are made gratuitously upon samples sent by mail, or delivered to the institution without charge. Samples sent for this purpose should be in their original condition, as broken out, and not crushed to a powder or pulp. Tests requiring determination of the presence of gold or silver must be paid for at assay rates. The locality from which the specimen is taken should be stated so that it may be entered upon the records of the museum of the school.

QUANTITATIVE DETERMINATIONS.

When quantitative determinations or analyses are required, or when assays showing the quantity and value of a metal or metals are necessary, a charge is made under the provisions of the territorial law of March, 1897, regulating the prices or fees to be charged for an assay at the University. These rates are shown in the following schedule:

Assaying Ores From Arizona.

Silver and gold, or either	\$ 50
Silver, gold and copper.	1 00
Copper	50
Ores containing more than three common metals	1 50

The following rates have been established by the Board

of Regents for assaying ores taken from deposits or mines without the Territory of Arizona.

Assaying Ores from Without the Limits of Arizona.

Silver and gold, or either alone.....	\$1 00
Copper.....	1 00
Lead.....	1 00
Zinc.....	2 50
Iron.....	2 00
Silica.....	1 50
Alumina.....	5 00

And for other determinations such rate as the director of the school of mines may in each instance fix.

Payment in Advance Required.

The director is required, in all cases, to hold the assay until the fee or charge therefor is paid.

Rates for Sampling.

Lots of 100 pounds or less, including assays of three metals.....	\$5 00
Each additional 100 pounds, to 500 pounds....	1 00
Over 500 pounds to 1 ton.....	10 00
Each additional ton.....	4 00

Reducing to Metal by any Process, as below.

Ordinary Stamp Mill test and plate amalgamation, for first ton or fraction of a ton....	\$20 00
From 1 to 2 tons.....	30 00
Pan Amalgamation, including crushing and assays, per ton.....	20 00

Large lots, proportionately less, per ton; small lots more in proportion.

Cyanide Process.

The School of Mines is prepared to make experimental tests of ores and of tailings by the cyanide process in large or small quantities, at rates to be agreed upon with the Director.

Working tests and experiments by other processes may be undertaken at rates to be agreed upon in each instance, depending upon the amount of materials, time and labor required.

Concentrating (Including all Assays.)

Wet or dry test of small lot (under 500 lbs.)	\$15 00
500 pounds to 1 ton	20 00
Each additional ton	7 00

In addition to the regular assay work for the precious and ordinary metals, quantitative determinations are made of the value and amounts of the rare metals, such as tungsten molybdenum, vanadium, uranium, etc

Directions for Forwarding Samples.

Samples for assay may be most conveniently, expeditiously and cheaply sent by mail if under four pounds in weight. Each sample should be labeled by a slip of paper, inside, giving the name and locality of the claim and the address of the sender.

As the express company does not deliver goods at the University there is a delay of a day or more in the reception of samples sent by express. Much vexatious delay may be avoided by using the mail. Sample bags of stout paper addressed to the School may be obtained upon application to the director at the rate of 25 cents per dozen to cover cost and postage.

As by order of the Board the results of assays cannot be delivered until the fees are paid, delays will be avoided by a remittance with the samples. Remittances may be by check, postal order, express order or by enclosing the money with the sample, first securely wrapping it in paper.

Delay is also avoided by addressing communications and samples direct to the School of Mines. Checks and money orders should be made payable to the School of Mines.

Unless otherwise directed the certificate of the results of an assay will be forwarded by mail to the consignor of the sample.

Special rates of freight on consignments to the "Director of the School of Mines," are granted by the Southern Pacific R. R. from points in Arizona. Ask the agent at shipping point for particulars.

All business communications should be addressed to the
ARIZONA SCHOOL OF MINES,

WM. P. BLAKE, Director.

Tucson, Pima County, Arizona.

THE TERRITORIAL MUSEUM.

The Arizona Legislature, Session 1893, passed an Act establishing a general Museum at the University. The object of this is to collect materials of all kinds illustrating the resources and development of the region, and particularly to preserve historical relics, including those pertaining to the aboriginal inhabitants.

Donations of specimens and collections will be received and acknowledged with thanks; but no provision has yet been made by the legislature for the support of this department, aside from the appropriation of \$100 per annum for the salary of a curator for two years.

A collection has been bequeathed by the late Edward Rose, of Pleasant Valley, Gila county, and the nucleus of additional collections will come from duplicates of the material obtained by members of the faculty in their annual tours of scientific investigation in the territory. The collection of minerals made by Mr. Sorrin, at the World's Fair, in 1893, is also placed with the foregoing. Historical records of much value are being gradually accumulated as a part of this museum, and an appeal is made to old settlers and others to bear this fact in mind when making disposition of articles bearing even remote relation to the early pioneers and their history. All records and data of any nature which can be gleaned are worthy of preservation, and we earnestly desire to have them placed at the University where they will always be accessible for reference.

A large and valuable collection of skins of the birds of Arizona has been deposited by Mr. Herbert Brown in the museum.

It is desired to make the collection of ores and minerals fully represent the great mineral resources of Arizona, and specimens from all of the mines will be thankfully received and acknowledged.

All business communications should be addressed to

HERBERT BROWN, Curator.

SPECIAL NOTICE.

Reduced Railroad Rates to and From the University.

The Southern Pacific, the Maricopa, Phoenix & Salt River Valley Railway Company, the Santa Fe, Prescott and Phoenix railway, and the G. V. G. & N. railway from Bowie to Solomonville, have all generously allowed students in attendance upon the University, half rates when journeying to and from their homes. In the case of students coming to the University these half rates may be secured by notifying the president of the University a sufficient length of time in advance to enable him to secure from the proper authorities the permits. Students at the University may secure transportation to their homes and return at any time by making application at the office of the president of the University.

The railroad authorities have very kindly supplied a quantity of blanks to be filled out and presented to the proper ticket agents. It is hoped and expected that like concessions may be secured over all the roads in the territory, as students may desire to travel over various lines in coming to the University.



LIST OF STUDENTS 1897-98.

Seniors.

Ferrin, Hattie, (General Course).....	Tucson
Gillett, Granville Malcom, (Electrical Engineering).....	Phoenix
Watts, Minnie Ruth, (General Course).....	Congress
Young, John Desha, " "	Phoenix

Juniors.

Garnett, Robert F, (Mining and Metallurgy).....	Phoenix
Miller, Eric Rex, " " "	Prescott
Morton, Robert L, " " "	East Randolph, N Y

Sophomores.

Flood, Ida Clarissa.....	Tucson
Haynes, Felix Grundy.....	Sacaton
Logan, Harry Gaylord.....	Phoenix
Sparks, Ralph Waldo.....	"
Richmond, Charles Pierce.....	"
Sergeant, John W.....	"
Welles, Florence Russell.....	Tucson
Welles, Justice Philip, Jr.,.....	"
Guild, Nott E.....	"

Freshmen.

Angus, William.....	Tucson
Castaneda, Rudolph.....	Benson
Drachman, Albert.....	Tucson
Ferrin, Clara.....	"
Frazier, Claire.....	Phoenix
Grijalva, Arturo Ochoa.....	Benson
Luce, Robert F.....	Yuma
McBride, William A.....	Phoenix
Morton, John H.....	East Randolph, N Y
Parker, George M.....	Tucson
Smalley, Fred H.....	Montawac, W
Steele, Edward.....	Willcox

Third Preparatory.

Brown, Ruth.....	Tucson
Colbath, James Sollitt.....	Holbrook
Culver, Emma.....	Tucson
Early, Clinton Claude.....	Phoenix

Finley, James William.....	Tucson
Foley, John W.....	Bisbee
Harley, Fanny.....	Prescott
Johnson, Emma A.....	Tucson
Logan, Walter H.....	Phoenix
Long, James Marcus.....	"
McKenna, Stephen S.....	Tucson
Orndorff, Seth Buford.....	"
Parker, Grace Miles.....	"
Potts, Francis L.....	Kingman
Priest, Gertrude E.....	La Fortuna
Schmid, Arnold.....	Bisbee
Smith, Bessie.....	Tucson
Tuttle, Arthur L.....	Safford
Watts, Carrie Mabel.....	Congress
Wakefield, Walter James.....	Tucson
Wilkinson, Ina E.....	"

Second Preparatory.

Alexander, Andrew Charles.....	Ft. Thomas
Armstrong, Carrie.....	Tucson
Armstrong, Violet Agnes.....	Tucson
Carty, Harry A.....	Holbrook
Castaneda, Henry.....	Benson
Cheyney, Bernice.....	Tucson
Dial, Joseph H.....	Safford
Doyle, Mary.....	Tucson
Goodwin, Lillie.....	"
Greer, Thomas L.....	Holbrook
Grenfell, Edith Etna.....	Bisbee
Groesbeck, Frank B.....	Safford
Guild, Roy.....	Tucson
Hasselgren, Harry William.....	Tombstone
Herrick, Henry Clay.....	Fairbanks
Herndon, Thomas.....	Tucson
Hill, Geo. V.....	Tombstone
Hoff, Mamie.....	Tucson
Horn, Guy W.....	Mesa City
Hughes, Atanasia.....	Tucson
Hughes, James.....	"
Jones, Arthur G.....	Holbrook
LaChance, Ethel Alice.....	Phoenix
Likes, Arillia May.....	Fairbanks
Lapham, Ina O.....	Tucson
Manning, Blanche.....	Tucson
Mansfeld, Samuel.....	"
McGuirk, Clara.....	"
Merritt, Fred M.....	Schultz

Orndorff, Lee.....	Tucson
Priest, Raymond.....	LaFortuna
Reid, William P.....	Casa Grande
Richardson, Beryl.....	Tucson
Sanford, Earl.....	Prescott
Schafer, Joseph P.....	Dos Cabezas
Scott, Lynda Maud.....	Holbrook
Steinfeld, Lester.....	Tucson
Stout, Charles E.....	Tucson
Warner, Robert Elmore.....	Bisbee
Weir, Martha.....	Tucson
Williams, H. E.....	Pima
Wood, Pauline.....	Tucson
Woodward, Dean.....	Phoenix

First Preparatory.

Baird, Frank.....	Concho, Ariz
Barkley, Hassie May.....	Mesa City
Bernard, Allen Chartan.....	Tucson
Brown, Owen.....	"
Calderon, Gerardo.....	Hermossillo, Sonora
De la Ossa, Albert.....	Lochiel
Doyle, Ella.....	Tucson
Finley, Charles.....	"
Fish, Florence.....	"
Flainig, Matt.....	Bisbee
Francis, Corrinne.....	Tucson
Gittins, Kate.....	Washington Camp
Igo, John.....	Ft. Huachuca
Katzenstein, Alma Fanny.....	Tucson
Linder, Jacob A.....	Nogales
Maher, Katie B.....	Tucson
Martin, George.....	"
Martin, Madge.....	"
Martin, Willie B.....	"
Pearce, William.....	"
Parks, Charles W.....	Solomonville
Potts, Lallah Zaff.....	Kingman
Paul, Edith.....	Tucson
Reicker, Edna Florence.....	"
Riggs, John D.....	"
Robinson, James Newton.....	Geronimo
Rolett, Albert Ralph.....	Tucson
Schafer, William A.....	DosCabezas
Soldini, Constance Rosalie.....	Tucson
Strauss, Ruth.....	"
Stevens, Elisia.....	"
Villasenor, Julio.....	Hermosillo, Sonora

Wadhams, Jennie Lea.....	Tucson
Wood, Gwendylin.....	"
Woodford, Lincoln D.	"

Special Students.

Arriago, Alfredo (English).....	Vera Cruz, Mex.
Benson, William Almon (Assaying).....	Florence
Brown, Stephen D. (Assaying).....	Tucson
Butler, Chauncey Eldridge (Assaying).....	Salina, Kan.
Cowan, Mrs. Rosalie Rice (Spanish).....	Tucson
Davidson, Edith (English, Elocution).....	Los Angeles, Cal.
Delano, Cora (Stenography, Book-keeping).....	Tucson
Doan, Frank Wilson (Chemistry).....	Florence
Drachman, Myra (Elocution).....	Tucson
Drachman, Lillie (Stenography, Book-keeping).....	"
Felix, Arthur (Book-keeping).....	"
Fish, Frank (Assaying).....	"
Goodfellow, Emma Dottie (Stenography, Book-keeping).....	"
Healey, Terrance (Chemistry).....	"
Hill, Annie (English).....	Bisbee
McLeod, Alexander Forrest (Assaying).....	New York, N. Y.
Mendenhall, Montford (Assaying).....	Tucson
Morgan, Eddie Leon (Assaying).....	Breckenridge, Tex.
Nesbital, William C. (Spanish).....	Tucson
Powers, Ridgley C. (Assaying).....	Prescott
Riggs, Lizzie (Book-keeping).....	Tucson
Rochester, E. R. (Assaying).....	Tucson
Scholey, Charles K. (Chemistry).....	Maher
Scribner, James V. (Assaying).....	Tucson
Towner, Nora (General Course).....	"
True, Arthur Leander (Assaying).....	Spokane, Wash.
Wilbur, Mary L. (Stenography, Book-keeping).....	Tucson
Zeigler, Albert (Stenography, Book-keeping).....	"

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Total.....	156

MILITARY ORGANIZATION, 1897=98.

Commandant of Cadets, LIEUT.-COL. NATHAN H. BARNES.

Adjutant.....	Felix Grundy Haynes
Sergeant Major.....	Clinton Claude Early
Quartermaster Sergeant.....	James Sollitt Colbath
Principal Musician.....	Stephen S. McKenna
Musician Corporal.....	Harry Augustus Carty
“ “	Samuel Mansfield

COMPANY A.

Captain.....	Charles Pierce Richmond
1st Lieutenant.....	Phillip Justice Welles, Jr
2nd “	Edward Steele
1st Sergeant.....	Thomas Austin Herndon
Sergeant.....	Joseph Peter Schafer
“	Frank Wilson Doane
“	Charles K. Scholey
Corporal.....	Andrew Charles Alexander, Jr
“	Lee Hickerson Orndorff
“	Robert Elmore Warner

COMPANY B.

Captain.....	Harry Gaylord Logans
1st Lieutenant.....	John William Seargeant
2nd “	Rudolph Castaned
1st Sergeant.....	Joseph H. Dia
Sergeant.....	William P. Rei
“	Dean Woodward
Corporal.....	Allen Chartan Bernar
“	George Vernon Hi
“	James Newton Robinso

ALUMNI ASSOCIATION.

Organized June 2nd, 1897.

CONSTITUTION.

In order to promote the interests of the University, to secure unity among its graduates, and to foster an attachment to our Alma Mater, we do hereby constitute ourselves as asso

ciation to be known as the *ALUMNI ASSOCIATION OF THE UNIVERSITY OF ARIZONA*.

I.

All persons who have received a degree from the University of Arizona are members of this association.

II.

All members of the faculty are honorary members of this Association.

III.

The officers of this Association shall be a president; one vice-president from each successive group of five classes, provided that when the last group shall number three classes it shall thereafter be entitled to a vice-president, a secretary and a treasurer.

IV.

There shall be an executive committee to consist of the following persons: The secretary and treasurer of the association, and three others chosen by the association, one of whom shall be designated as chairman of the committee.

V.

It shall be the duty of the executive committee to arrange the programmes for Alumni Day and other public occasions; to regulate the finances of the Association; to perform such other duties as may be imposed upon them, and to attend to all business of the Association not otherwise provided for.

VI.

The president shall be ex-officio a member of all committees. At each annual business meeting he shall appoint a committee of two persons to audit the treasurer's accounts.

VII.

The officers and the executive committee shall be elected by ballot at the annual business meeting to be held on Alumni Day, a majority of all votes cast being necessary for election.

VIII.

Any proposition to alter or amend these articles of Association must be made at a regular meeting, and have the assent of two-thirds of the members present.

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**The
University
OF
Arizona.**

**Eighth Annual Register,
1898-99.**

—WITH—

Announcements for 1899-1900.

Tucson, Arizona,

1899.



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GF

CALENDAR 1899-1900.

1899.

September 18 and 19, } Entrance Examinations at University.
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September 20, Wednesday.....Registration Day.
September 21. Thursday.....Recitations Begin.
November 30 and Dec. 1, Thursday and Friday } Thanksgiving
} Recess.
December 21, Thursday.....First Term Ends.

1900.

January 2, Tuesday.....Recitations Resumed.
February 1, Thursday.....First Semester Ends.
February 2, Friday.....Arbor Day.
February 5, Monday.....Second Semester Begins.
March 16, Friday.....Second Term Ends.
March 20, Tuesday.....Third Term Begins.
May 29, Tuesday.....Recitations End.
May 30, Wednesday.....Decoration Day.
May 31, Thursday.....Commencement Day.



BOARD OF REGENTS.

Ex-Officio.

HON. N. O. MURPHY.....	Governor of Arizona.
HON. R. L. LONG.....	Superintendent of Instruction.

Appointed by the Governor of the Territory.

HON. WILLIAM HERRING, Esq., Chancellor.....	Tucson.
HON. H. W. FENNER, M. D. Secretary.....	Tucson.
HON. HERBERT B. TENNEY, Treasurer.....	Tucson.
HON. CHARLES R. DRAKE.....	Tucson.



FACULTY, ETC.

MILLARD MAYHEW PARKER, A. M.,

President and Professor of Civics.

WILLIAM PHIPPS BLAKE, Ph. B., A. M.,

*Professor of Geology, Metallurgy and Mining. Director
School of Mines.*

JAMES WILLIAM TOUMEY, M. S.,

*Professor of Biology. Botanist and Entomologist, Agricultural
Experiment Station.*

HOWARD JUDSON HALL, A. B.,

Professor of English. Librarian. Governor of Barracks.

ROBERT HUMPHREY FORBES, M. S.,

*Professor of Chemistry. Chemist Agricultural Experiment
Station.*

SHERMAN MELVILLE WOODWARD, A. M.,

*Professor of Mathematics. Meteorologist Agricultural
Experiment Station.*

FRANK YALE ADAMS, A. M.,

*Professor of Ancient and Modern Languages and History.
Commandant of Cadets.*

FRANK NELSON GUILD, B. S.,

Professor of Mineralogy. Assayer.

C. S. PARSONS,

*Director Agricultural Experiment Station. Irrigation
Engineer.*

ALFRED JAMES McCLATCHIE, A. M.,
Professor of Agriculture and Horticulture.

DAVID HULL HOLMES,
Shopwork and Drawing.

MRS. MARY BERNARD AGUIRRE,
Instructor in History and Spanish.

MARGARET BAIRDE RANDAL,
*Instructor in English Branches, Elocution and Physical
Culture.*

JAMES OLIN TURNER, A. B.,
Instructor in Preparatory Department.

MRS. EMMA MONK GUILD,
Instructor in Preparatory Department.

JOHN N. SUMMERS, B. S. D.,
*Principal Preparatory Department. Instructor in Commer-
cial Branches and Mathematics.*

NORA TOWNER,
Stenography.

CHARLES PIERCE RICHMOND,
Military Instructor.

HERBERT BROWN,
Curator of Territorial Museum.

MRS. IMOGEN LA CHANCE,
Matron of Dormitory.

LOCATION, CLIMATE, ETC.

The University of Arizona is located near Tucson, the county seat of Pima county, and one of the largest towns in the territory.

Tucson is on the main line of the Southern Pacific railway, 312 miles west of El Paso, Texas, and 500 miles east of Los Angeles, Cal. It is easily reached from east and west without change and has railway connections with the central and northern portions of the territory *via* Maricopa, and with north-eastern states *via* Deming. The town lies in a broad, flat valley, at an elevation of 2,400 feet above sea level, and is surrounded by mountains. Its dry, healthful situation with its mild and equable climate has made Tucson a famous health resort, particularly for pulmonary patients.

The winter climate is especially good. Its temperature is cool and strengthening without being severe. The lowest temperature recorded during the average year is about 20 degrees above zero, Fahrenheit. But little rain falls during the winter; fogs are unknown; cloudy days are rare, the percentage of sunshine throughout the winter being greater than that recorded at any other place in the United States. In the summer the temperature ranges high, but the dry heat of this region differs greatly from the moist and oppressive heat of the eastern and gulf states. Owing to the extreme dryness of the air the highest temperatures known are less oppressive to the senses, and less dangerous to the health, than the summer heat of the upper Mississippi valley states.

The total amount of rainfall averages less than twelve inches. Of this amount fully one-half falls during July and August; yet the amount is so small as not materially to increase the atmospheric humidity, and the summers are found to be remarkably healthy. In general the climate may be described as well suited to nearly all people, but is particularly beneficial to the young, and to those who cannot endure with comfort and safety the extremes of temperature and the sudden changes of northern climates.

The University was established by an act of the Territorial Legislative Assembly passed in 1885. A tract embracing forty acres of land lying just outside the city limits was selected as a site and was donated by the citizens of Tucson. A contract for erecting the main building was let in October, 1887, but owing to financial delays the building was not opened to students until October 1, 1891. The site selected is upon high ground about a mile from the business center of the city. On every side, it commands a view of mountain scenery of remarkable extent and grandeur. The location cannot be surpassed for healthfulness. The University possesses its own water system. The supply is drawn from a well on the premises one hundred feet deep, and is of unusually good quality.

BUILDINGS.

The main building is two hundred by one hundred five feet, two stories in height, the lower story of gray stone, the upper of red brick, and is completely surrounded by a wide two-story veranda. This building contains the offices, recitation rooms, laboratories, and apparatus rooms of the various departments; an assembly room, the libraries of the University and Experiment Station, and the Territorial Museum. Adjoining the main building is the mining annex, eighty by sixty feet, filled with metallurgical machinery.

Three cottages have been built. They are of brick, two stories in height, and were intended to accommodate each two families. They were originally designed as homes for instructors, but owing to the pressure for accommodation for students on the University grounds, two of the cottages have been converted into homes for young ladies and furnish excellent accommodations for twenty-five persons, while the third is used as a residence for the president.

A dormitory built of a fine quality of gray stone, two stories in height, has been provided as a home for male students. It contains a students' dining room, kitchen connected therewith, and twenty rooms, each large enough to accommodate two students.

A substantial brick building contains a suite of rooms for the use of the assaying department, and also a carpenter shop. The assay rooms contain a large smelting furnace with necessary muffle furnaces and other accessories, while the carpenter shop has an engine for power work, with lathes and other machinery for convenient operation.

Other buildings are the boiler house, which also contains the well and pumps whereby the water supply for irrigation and general purposes is obtained; the new green house, eighty by twenty-one feet, built wholly of glass; the old green house, now used as a propagating house, also of glass; the cottage occupied by the assistant horticulturist; and a temporary wooden building used as a young men's dormitory. It is expected that in the near future the University will be able to add another wing to the stone dormitory, nearly doubling the present dormitory accommodations, and thus relieving the pressing demands in that direction.

EQUIPMENT.

LIBRARY.

The library is a department of the University that is increasing in efficiency with the growth of the institution. The books have been selected with great care, with a view both to the requirements of the various departments of instruction and also to the building up of a well-balanced, symmetrical collection of books. All the books are new and standard. The scientific works represent the highest and latest authority while the literary and historical works are the writings of the best known and most thoroughly tried authors. A main object in making the selection has been to furnish students with books of the highest class and to encourage them in habits of careful reading. Complete bound sets of the leading American periodicals, both literary and scientific, are being collected every year so that the library is already valuable as a means of research in present-day problems.

The latest editions of the best cyclopædias and dictionaries are constantly at the students' disposal. The leading American scientific and literary publications as well as the territorial newspapers are found in the reading-room. The reading-room and library are open to students for an average of eight hours each day.

Aside from government publications and pamphlets the library contains 3600 bound volumes of which 500 have been added during the present year. Of the whole number about three-fifths are scientific works, the remaining belonging to general literature, biography and history.

A complete card catalogue of authors and title is maintained.

CHEMISTRY.

The chemical laboratories are two in number. The smaller one on the upper floor of the main building is for the use of students and is equipped for teaching the theory and practice of chemical science. The room for laboratory work is well lighted, provided with gas, water, working desks, ventilating hoods, an abundance of apparatus and chemicals with which to carry on experimental work, and can be made to accommodate about twenty-four students. Adjoining the large room is a small store-room stocked with apparatus for demonstrating the principles of chemistry and containing well selected collections of chemical substances.

The Experiment Station laboratory occupies three large working rooms and two small store rooms on the lower floor of the main building. This laboratory is devoted to analytical work and chemical investigations relating to the agricultural interests of the territory. It is excellently equipped for the special lines of investigation in which it is engaged, and although not primarily intended for the use of students, it has educational value to those who desire to witness the operations of a working laboratory. The equipment includes chemical balances, chemical apparatus and supplies, machinery for

preparing samples, and special appliances for the analysis of milk, agricultural products, tanning materials, and soils.

BIOLOGY.

The biological laboratories occupy three rooms in the south-west half, second floor of the south wing of the main building. These rooms are piped for gas and water and liberally provided with apparatus for research and for giving instruction on biological subjects. Students pursuing histological work are provided without expense with simple and compound microscopes, as the nature of their work demands. The laboratory is equipped with microtomes, culture baths, oven and other accessories used in modern methods of research.

An herbarium, containing nearly ten thousand sheets of plants, mostly indigenous to the south-west, a large percentage being from Arizona, is an important factor in the equipment. Some fifty cases of insects, including one large cabinet, are of value in giving instruction in entomology and to illustrate the economic insects of Arizona. The work in general and systematic zoology is greatly facilitated by the Herbert Brown collection of birds, and by other zoological material which has been brought together during the past five years.

To aid in the study of human and comparative anatomy and physiology there are provided articulate and disarticulate human skeletons, plaster and papier-mache models of the important organs, and microscopical preparations illustrating the structure of the various tissues. The equipment also includes special apparatus for use of advanced students in the department.

AGRICULTURE AND HORTICULTURE.

Two rooms upon the first floor and near the central part of the main building are used for the work in the study of agricul

ture and horticulture, and for the Agricultural Experiment station headquarters. The equipment is fairly complete. There have been imported from Europe several of the best Azoux models of portions of the domestic animals, showing normal and morbid conditions; also several cases of products of the vegetable kingdom. A very large collection of garden and farm seeds has been secured and arranged in jars and properly labeled. There is also a selection of garden tools, and instruments used in veterinary surgery. Recently there has been imported from Germany a collection of charts illustrating the anatomy and physiology of some of the fruits and grains. Specimens of the best fruits, grains, and other farm products are constantly received for examination; also specimens of an abnormal nature.

The old green-house, about fourteen by twenty feet in area, is used as a propagating house, and a new one has just been built, twenty-one by eighty feet in size, constructed of glass throughout. Laboratory work is provided for in these green houses, and in field work upon the University grounds. The general library contains many of the standard and most valuable of the recent publications upon agriculture in its various branches, and the science upon which it is based. All the bulletins and reports of the experiment stations of the United States and foreign countries are on file in the station library, and the principal agricultural and horticultural journals are upon the table of the reading room.

ENGINEERING.

Recognizing the fact that the first actual engagement secured by the engineering student will be either in the field with a surveying party or in the shop or drafting office, the equipment of this department has been chosen with a view to developing the highest skill in these fundamental lines of work. Already liberal, it is constantly being enlarged. It embraces surveyors' and engineers' chains; standard field and pocket

tapes; plain and solar compasses and transits; engineers' levels; stadia, level, and transit rods; aneroid barometers; odometers; pedometers; automatic water registers; hook gages; three forms of current meters; stop-watch; meteorological instruments; drafting instruments; mechanical calculators; blue print apparatus; a four and one-fourth inch astronomical telescope with equatorial mountings and accessories; celestial sphere; a 75-light Mather dynamo; a Westinghouse high speed engine; pumps, steam gauges, indicators, calorimeters, etc.

MINING AND METALLURGY.

The Department of Mining and Metallurgy is well equipped for giving both theoretical and practical instruction in the arts of mining, metallurgy, and assaying in all its branches.

Attached to the main building is an annex or mill, containing machinery and appliances for crushing, sampling, concentrating, amalgamating, leaching, chloriding, cyaniding, and the electrical treatment of various kinds of ore in large or small lots. Power is furnished from a seventy horse-power boiler, detached from the main building, the steam being carried under-ground to the engine-room, which contains a thirty-five horse-power engine, built by the Walburn-Swenson Manufacturing Co., of Fort Scott, Kan., and a sixteen horse-power Westinghouse automatic engine; the latter being used for running the dynamo.

The mill building has a storage capacity for ore of fifty to one hundred tons. From the bins the ore passes to the crushing floor above. A seven inch by ten inch Blake crusher is used for coarse crushing, and a Dodge crusher for finer work. Beneath the Blake crusher is a set of fourteen-inch by twenty-inch Cornish rolls, from which the ore passes by a conveyor to the main elevator, which carries it up thirty-one feet to the top of the mill. By means of slides and chutes the crushed ore may be sent at will to various machines to be

tested by different methods. For concentration there are provided revolving sizing screens giving facilities for preparing six sizes, besides hydraulic separators for classifying slimes into three grades. The coarser sizes may be worked upon full sized jigging machines of the Hartz pattern, the finer sizes being jigged upon bottom discharge machines, and the slime worked upon a double Rittinger percussion table, or otherwise as desired. A small apparatus, run by an electric motor, is also provided for dry concentration. Amalgamation tests may be made upon a working scale by different methods including plates and riffles, pans and settlers, etc. A five-stamp gold mill with silvered plates and aprons of the latest and most approved construction, by Fraser & Chalmers, of Chicago, has recently been added to the mill, thus permitting the working of free-milling gold ores by the usual methods and on a large scale. Several lots of ore have been successfully worked and returns made in gold bullion, thus familiarizing the mining students with all the details of seeding, stamping, cleaning up, retorting, smelting, and assaying.

In addition to the five-stamp mill a smaller prospecting mill of three stamps has been added so as to work small lots of ore of from 100 to 500 pounds. A sampling mill permits of rapid crushing and mixing large samples preparatory to assaying.

The assay laboratory is equipped with assay furnaces for crucible work, for scorifying and cupelling, and for retorting mercury from amalgam. An adjoining room, supplied with water, gas and electric current, has a roomy hood for work involving fumes, with tables and desks for student work, besides all needed appliances for assaying by dry and wet methods including electrolysis.

The laboratory also has desks and fittings for the chemical work required in the metallurgical and mineralogical investigation and analysis of ores, mineral fertilizers and qualitative tests of minerals.

PHYSICS.

Three large rooms in the basement of the main building are set apart for the teaching of physics. The facilities for experimental demonstration of all important phenomena are very complete. The lecture room is fitted with shutters, so that it can be darkened. A beam of sunlight, directed by a fine clock heliostat outside, may be thrown steadily across the lecture table for experiments on light, or used in connection with the solar lantern for a variety of other work. The lecture table is supplied with gas, water, electric currents from primary and storage batteries, and from the large dynamo:

Adjacent to the lecture room are the physical laboratory and the apparatus room in which are kept the many instruments owned by the University, among which may be mentioned: an Atwood's machine; Kater's pendulum; whirling table; many balances; barometers; an air pump and accessories; a hand dynamo; motors; six storage cells; a large number of primary batteries; induction coils; Deprez-D'Arsonval tangent, and sine galvanometers; rheostats; Wheatstone's bridges; a fine testing set; a Wimshurst electric machine; Leyden jars; Geissler's and Crooke's tubes; diapasons; a sonometer; lenses, prisms, and mirrors of all kinds; a polariscope; steam gauges; indicators; calorimeters; and a full equipment of simple pieces of apparatus for the use of elementary classes.

REQUIREMENTS FOR ADMISSION, ETC.

Applicants for admission to any department of the University will be required to furnish satisfactory evidence of good moral character, and of honorable dismissal from the schools with which they were last connected.

For admission to the freshman class, applicants must be at least sixteen years of age and must pass satisfactorily exam

inations in subjects sufficient to give nine credits as described below. One study pursued satisfactorily for one year, one period a day, as ordinarily taught in high schools, entitles a student to one credit. The subjects upon which examinations must be passed and the credits assigned, are:

Mathematics, including arithmetic, algebra, and plane geometry—3 credits.

English—2 credits.

History and Civics—1 credit.

Elementary Science—1 credit.

Latin, German, French or Advanced Science—2 credits.

The scope of work required in the various subjects is indicated below.

MATHEMATICS—Arithmetic, entire, including the metric system; Algebra, through quadratic equations, including factoring, the greatest common divisor, and the least common multiple, as treated by Wentworth or Wells; Geometry, all of plane. (Wentworth or Wells.)

ENGLISH—A competent knowledge of the elements of English grammar, composition, the elements of rhetoric, and the following English classics or acceptable equivalents: Longfellow's *Evangeline*; Irving's *Sketch Book*; Scott's *Ivanhoe* and *Lady of the Lake*; Whittier's *Snow-Bound*; Shakspeare's *Julius Cæsar* and *Merchant of Venice*; George Eliot's *Silas Marner*.

HISTORY—Ancient, Mediaeval and Modern. (The text book in use in the preparatory department is Meyers's *General History*.) United States History and the Science of Government.

ELEMENTARY SCIENCE—Geography, political and physical, as included in "Frye's *Complete Geography*;" Physics, as much as is contained in "Gage's *Introduction to Physical Science*." Note books covering such laboratory work as has been performed by the student should be presented for examination.

LATIN—As comprehended in “Collar & Daniells’ First Latin Book” and four books of Cæsar’s “Gallic War” or an equivalent.

ADVANCED SCIENCE—Two years’ creditable work in biological science, or chemistry, or physics, at least one-half of which has been laboratory work, the quality and scope of which must be shown by the original laboratory note books.

Beginning with September, 1900, the entrance requirements will be increased to twelve credits, including:

Drawing and Manual Training, or additional text-book subjects—3 credits.

If any language is offered it must be to the extent of two credits, as a single year’s study of a language is not considered to have sufficient educational value to be entitled to credit.

Students from other institutions of equivalent rank may be admitted to the higher classes upon the presentation of properly authenticated certificates, showing clearly to the satisfaction of the faculty that they are qualified to proceed with such work.

Arrangements have been made with the Arizona Territorial Normal School, at Tempe, whereby students from that institution may have their record transferred to the books of the University with full credit, upon presentation of a certificate duly signed by the principal. Students of this University may also obtain the equivalent privilege at the normal school by presenting the proper certificate of standing signed by the president.

The faculty desires to establish such relations with high schools and other educational institutions as will enable it to accept their certificates without question. To this end presiding officers are respectfully requested to correspond with the president.

REGISTRATION OF STUDENTS.

All students are required to register on registration day.

the beginning of the year in the president's office. A matriculation fee of \$5.00 is required of all students. Each will receive a card indicating the classes which he or she is to attend, and a receipt for the matriculation fee, when paid. No class card will be issued until all dues are paid. No change in registration can be made without the consent of the faculty.

Permission of the faculty is necessary to register at any time after registration day.

No student shall be permitted to register in the spring term of the senior year as a candidate for a degree who has not previously made up all failures and "conditions" in subjects required for the degree.

TERM RECORDS.

The class standing of each student is determined by the instructor in charge. The method of ascertaining the student's term record is left to the instructor, and his report in all cases is final.

MONTHLY REPORTS OF STUDENTS.

Reports of standing in classes are regularly sent each month to parents and guardians from the president's office. Those to whom these reports are addressed are urgently requested to examine each with care and to spur up delinquent students, or commend those who are diligent, as the case may be. Without such hearty co-operation, good results cannot be anticipated.

FACULTY MEETINGS.

Regular meetings of the faculty are held weekly.

Students' individual petitions must be in the hands of the president before the hour of faculty meeting in order to receive attention the same week. Petitions from classes, or from

any two or more students will not be acted upon by the faculty unless presented in writing to the president at least two days before the meeting at which action is desired.

DISCIPLINE.

It is understood that students enter the institution with serious purposes and that they will cheerfully conform to such regulations as may be made by the faculty. It is the aim of the faculty to maintain a high standing of integrity and a strict regard for truth. Any attempt on the part of a student to present as his own the work of another, or to pass any test or examination by unfair means is considered a most serious offense. Any conduct harmful to the moral standing of the school will, after due admonition, render a student liable to dismissal.

PRIZES.

Two prizes were awarded on commencement day, 1898, as follows:

A gold medal offered by Mr. Hugo Zeckendorf, of Tucson, for the best forensic discussion, to Nott E. Guild.

A silver medal, offered by the Faculty, for the second best forensic discussion, to Charles P. Richmond.

VACATIONS, ACCOMMODATIONS, ETC.

VACATIONS AND HOLIDAYS.

Short vacations (as per Calendar on page 3) are taken at Christmas and Easter. The long summer vacation begins about June 1st and continues until near the close of September.

All legal holidays are observed by the cessation of ordinary University work, and the Thanksgiving recess extends from the close of regular exercises on the preceding Wednesday until the Monday morning following.

Appropriate exercises may be arranged by the Faculty for any of the legal holidays, in which the students will be expected to join, if required.

Arbor day has been formally adopted by the University Faculty as the regular anniversary, on which shall be celebrated the founding of the institution, in connection with the ceremonies of tree planting.

LIVING ACCOMMODATIONS AND EXPENSES.

Provision is made as far as possible for furnishing board and rooms for students, of both sexes, upon the University grounds.

Young men have excellent quarters in the dormitory building.

A separate home for young ladies is in charge of an experienced and capable matron, who has constant supervision of those rooming in "ladies' hall."

There is no charge for tuition in the University. All students are required to pay once only, (upon entrance) a matriculation fee of five dollars.

Charges will be made for material actually consumed by students in the laboratories.

The expense for board and room rent will amount to about \$15.00 per month; charges for fuel and lights will be made to cover cost. By resolution of the Board of Regents of the University, board is to be paid in advance at the beginning of each term. Checks, P. O. or Express Money Orders should be made payable to the President. No reduction will be made for absence for a period of less than one week.

Students will be provided with simple furniture, including single bedstead, mirror, wash-bowl, pitcher, and slop jar. They will supply their own mattress, pillow, bed clothing, towels, etc. They will care for their own rooms, and the halls, staircases, and study rooms of their respective dormitories under the direction of the person in charge.

Text-books required are obtained direct from the publishers through a book association managed on the co-operative plan under the direction of the Faculty, and may vary in cost to a student between five and ten dollars in different years of the course.

Economical students should readily go through the year with \$150.00 to \$175.00 excluding clothing.

Members of the batallion will be required to provide themselves with the prescribed uniform. During the past year the cost of uniform with cap, and including transportation charges, has been \$15.50. This uniform has shown better wearing qualities than a civilian suit of equal cost, and parents are urged to consider the matter of uniform when supplying their sons with clothing for the approaching school year. It may be worn on all occasions, and thus will remove the necessity for the usual expenditures for outer clothing other than overcoats.

Provision has been made for the self-support of students to a limited extent.

LITERARY SOCIETIES.

The Philomathean Society, an organization of students open to all, holds its meeting in the assembly room of the University. Its work embraces general literary exercises and parliamentary usage, and is a valuable adjunct to the regular college course.

The Lescha, a secret society of limited membership, open only to students of college grade, conducts regular meetings at the University. Its purpose is to promote the literary taste

and attainments of its members by rigid and serious work, special attention being paid to the art of debating, as also to gaining familiarity with parliamentary usages by constant practice.

ATHLETICS.

Encouragement is given to athletics and athletic organizations are under the immediate care of a committee of the faculty. Membership in these organizations is subject to forfeiture for failure in any regular line of school work.

MILITARY TRAINING.

Appreciating the importance of military drill as a physical exercise and as an aid to discipline, and in compliance with law, provision has been made for a course in military science and tactics.

Military drill is required of all male students throughout the preparatory course and as far as the end of the sophomore year, unless excused by the faculty for sufficient cause, and is optional through the remaining years. Students claiming exemption from drill by reason of physical disability will be required to secure from a physician designated by the faculty, a certificate of incapacity, except when the disability is apparent. In general the officers and non-commissioned officers will be chosen from the higher classes, scholarship as well as proficiency in drill being considered in making promotions.

Each member of the military organization will be required to provide himself with the prescribed uniform within six weeks after his entrance. The uniform consists of cap, coat and trousers of cadet gray cloth trimmed with black braid and closely resembles the undress uniform of the U. S. Military Academy at West Point. Black shoes and white cotton gloves are also required. A uniform vest is prescribed. The purchase of this garment is optional as it is not required to be worn unless the coat is worn unbuttoned. A committee of the faculty will protect the interests of students by inspecting all uniforms as re-

ceived from the makers in order to secure good materials and workmanship at a minimum cost.

An equivalent of the time occupied in military drill will be devoted by female students to physical culture, vocal culture, and instruction in the rudiments of hospital practice and prompt relief of the injured.

COURSES OF INSTRUCTION.

The facilities and privileges of the University are open to all qualified persons of either sex without charge.

Three regular four-year courses of study leading to a degree are offered, viz:

Literary and Scientific.

Engineering and Mining.

Agriculture.

In each course the work is partly required and partly elective as shown in schedules later. Four hours of recitation a day are required in each course as full work. In laboratory work two to two and one-half hours are considered the equivalent of one recitation hour.

Persons of mature age and with sufficient preparation who are not candidates for a degree will in some cases be admitted to regular classes as special students, without having taken the required work of the lower years of the course; provided, however, that in all such cases they show to the satisfaction of the instructor giving the course that they can take the work with profit to themselves and without detriment to the work of the regular class.

Work is offered in the following lines: English language and literature, Latin, Spanish, French, German, history and

civics, mathematics, physics, chemistry, biology, mineralogy and geology, drawing and shop work, engineering, mining.

The exact scope and nature of the various courses are shown in detail later.

Students, who have completed satisfactorily the required work and the specified amount of elective work in either of the four year courses, will be given the degree of Bachelor of Science. (B. S.)

Each candidate for graduation is required to present an acceptable thesis embodying the results of a special and thorough study of some subject within the range of the course pursued. The subject of the thesis must be submitted for the approval of the faculty not later than the opening of the second term of the senior year, and the completed thesis must be presented not later than three weeks before commencement day.

The advanced degrees of Master of Science and Master of Arts are conferred upon Bachelors, graduates from this University or from institutions of equivalent grade, who have successfully pursued a course of study marked out by the faculty and requiring not less than one year.

COURSES OF STUDY 1899-1900.

LITERARY AND SCIENTIFIC.

ENGINEERING AND MINING.

FRESHMAN YEAR.

Required—

English 1, 2.

Elective—

Mathematics 1, 2.

Latin 1, 2.

French 1, 2.

German 1, 2.

History 1, 2.

Spanish 1, 2.

Drawing 1, 2.

Required—

English 1, 2.

Mathematics 1, 2.

Shopwork 1, 2.

Elective—

French 1, 2.

German, 1, 2.

Spanish 1, 2.

History 1, 2.

SOPHOMORE YEAR.

Required—

English 3, 4.

Elective—

Mathematics 3, 4.

Latin 3, 4.

French 3, 4.

German 3, 4.

Spanish 3, 4.

Chemistry 1 } Chemistry 2
or Botany 1.

History 3, 4.

Required—

Mathematics 3, 4.

Surveying 1, 2.

Elective—

Chemistry 1, 2.

French 3, 4.

German 3, 4.

Spanish 3, 4.

Drawing 3, 4.

History 3, 4.

JUNIOR YEAR.

Elective—

English 5, 6.

Mathematics 5, 6.

Political Economy 1, 2.

Anatomy and Physiology 1.

Zoology 1.

Mineralogy 1, 2.

Required—

Mathematics 5, 6.

Elective—

Mineralogy, Assaying 1, 2.

Chemistry 3, 4.

Political Economy 1, 2.

Drawing 5, 6.

SENIOR YEAR.

Elective—

Psychology 1, History of Education and Pedagogy 1.

Geology 1, Astronomy 1.

Logic 1, Ethics 1.

And other electives not previously taken.

Required—

Physics and Mechanics 1, 2.

Geology 1, Astronomy 1.

Elective—

Metallurgical Chemistry 1, 2.

Mining and Metallurgy 1, 2.

And other electives not previously taken.

TABULAR VIEW.

The following list comprises both required and elective subjects arranged by semesters (half years) and periods of recitation. Unless otherwise stated five recitations per week are required in each subject. The Arabic numerals refer to courses as outlined elsewhere. Subjects to which a * is prefixed will be taught in 1899-1900 and each alternate year thereafter. Those to which a † is prefixed will be taught in 1900-01 and each alternate year thereafter. Those not thus designated are taught each year. Students are required to make such choice as will avoid conflict.

PERIOD I.

First Half Year

English 1.
 *French 3.
 †German 3.
 Mathematics 5.
 *Psychology 1.
 Spanish 3.

Second Half Year

English 2.
 *French 4.
 †German 4.
 *History of Education 1.
 Mathematics 6.
 Spanish 4.

PERIOD II.

First Half Year

Drawing 1 M. W. F.
 Elocution 1 Tu. Th.
 English 3.
 †Economics 1.
 History 3.
 Mining and Metallurgy.

Second Half Year

Drawing 2 M. W. F.
 Elocution 2 Tu. Th.
 English 4.
 †Economics 2.
 History 4.
 Mining and Metallurgy 2.

PERIOD III.

First Half Year

Drawing 3.
 Drawing 5.
 Elocution 3 Th.
 English 5.
 *Logic 1.
 History 1.
 Mathematics 1.

Second Half Year

Drawing 4.
 Drawing 6.
 Elocution 4 Th.
 English 6.
 *Ethics 1.
 History 2.
 Mathematics 2.

PERIOD IV.

First Half Year

Astronomy 1.
 Drawing 3.
 Drawing 5.
 †French 1.
 *German 1.
 Mathematics 3.
 Spanish 1.

Second Half Year

Drawing 4.
 Drawing 6.
 †French 2.
 Geology 1.
 *German 2.
 Mathematics 4.
 Spanish 2.

PERIOD V.

First Half Year

Anatomy and Physiology 1.
 Chemistry 1 Tu. Th.
 Chemistry 3 M. W. F.
 Latin 1.
 Latin 3.
 Metallurgical Chemistry 1
 M. W. F.
 Mineralogy & Assaying 1 Tu. Th.
 Physics and Mechanics 1.
 †Surveying 1 M. W. F.

Second Half Year

Botany 1.
 Chemistry 2 Tu. Th.
 Chemistry 4 M. W. F.
 Latin 2.
 Latin 4.
 Metallurgical Chemistry 2
 M. W. F.
 Mineralogy and Assaying 2
 Tu. Th.
 Physics and Mechanics 2.
 †Surveying 2 M. W. F.
 Zoology 1.

PERIODS VI & VII.

First Half Year

Anatomy and Physiology 1.
 Chemistry 1 Tu. W. Th.
 Chemistry 3 M. F.
 Metallurgical Chemistry 1 M. F.
 Mineralogy and Assaying 1
 Tu. W. Th.
 Physics and Mechanics 1.
 Shop Work 1.
 †Surveying 1 M. F.

Second Half Year

Botany 1.
 Chemistry 2 Tu. W. Th.
 Chemistry 4 M. F.
 Metallurgical Chemistry 2 M. F.
 Mineralogy and Assaying 2
 Tu. W. Th.
 Physics and Mechanics 2.
 Shopwork 2.
 †Surveying 2 M. F.
 Zoology 1.



EXPLANATORY OF COURSES OF STUDY.

ENGLISH.—*Prof. Hall.*

The object of the work in English is, first, to promote a taste for literature as a means of pleasure and of culture, and secondly, by means of the study of eminent authors to cultivate a correct standard of literary judgment and taste. With these objects in view the method of work is intensive rather than extensive. A few authors are chosen for careful study, and sufficient time is spent upon these to acquire accurate ideas of their individual merits and style.

In that part of the work devoted to composition the aim is to teach a direct, vigorous style as the outgrowth of clear-cut, accurate thought.

ENGLISH 1, 2, I—LITERATURE; NINETEENTH CENTURY PROSE.—*Freshman Year.*—A few of the leading prose writers of the nineteenth century are studied chiefly as a basis for appreciative, sympathetic criticism. The following authors and works will occupy the greater part of the time: Macaulay, select essays; Carlyle, *Heroes and Hero-Worship*; DeQuincey, *Confessions*. Minto's *Manual of English Prose* is used as a guide.

ENGLISH 3, 4, II—RHETORIC AND COMPOSITION.—*Sophomore Year.*—Genung's *Practical Rhetoric and Rhetorical Analysis* and Baker's *Specimens of Argumentation* (modern) are used as text-books. One-third of the time is devoted to composition, chiefly expository and argumentative, briefs and finished papers being required once a week of each student at that stage of the work.

ENGLISH 5, 6, III—LITERATURE.—*Junior Year.*—Shakspeare, at least five plays; Milton, minor poems and *Paradise*

Lost; Wordsworth, Keats, Shelley and Tennyson are studied as extensively as time will allow.

LATIN.—*Prof. Adams.*

The aim of the work in Latin will be to produce in the student the ability to read the original with an appreciation of its meaning and beauty without conscious translation into the vernacular. Incidentally and of no less value, it is expected that his power of observation, mental ability, and knowledge of the use of English will be greatly strengthened. The instruction throughout the course will be shaped with the above ends in view. The laboratory method will be used in part, giving to each pupil the opportunity of doing as much work as his strength and knowledge of the subject will allow.

SUB-COLLEGIATE.

LATIN A—FIRST YEAR—Special attention will be given to vocabularies; an accurate knowledge of all inflectional forms will be insisted upon, and the student will be led to investigate and discover the underlying laws and principles on which these are based. Attention will be paid to the Latin sentence structure, and the comparison of this with English sentence structure, and in translation from Latin to English, idiomatic English will be insisted upon, while in translation from English into Latin, attention will be called to the English grammatical structure and its comparison with the Latin. In the latter part of the year easy Latin, like *Viri Romae*, will be read. Text-book: Collar's First Latin Book.

LATIN B—SECOND YEAR—An introduction to the study of Roman literature. Selections from Cæsar, the Lives of Nepos, and similar Latin will be read with much sight reading. The text will be studied critically with translation into idiomatic English. Prose composition will be continued throughout the

year with incidental study of history and geography. Text-books: Allen and Greenough's Grammar and texts; Daniell's or Bennett's Prose Composition.

COLLEGIATE.

LATIN 1, 2, V.—THIRD YEAR—Cicero's Orations and Vergil's Aeneid will be read. While the same principles will govern the work as in the second year, more attention will be paid to sight reading and to the reading of the original with an appreciation of its meaning in the same way that English is read. In connection with the reading of Cicero a thorough study will be made of the Roman system of government and the customs and occupations of the people. In connection with the Aeneid a similar study will be made of Latin poetry and the scansion of the hexameter, also of the religious rites and beliefs of the ancients together with the principal mythological characters. Throughout the course attention will be paid to word study and English derivatives of Latin words.

LATIN 3, 4, V.—FOURTH YEAR—The work will consist of selections from Livy, Book XXI, Cicero De Senectute and De Amicitia, Horace, Odes and Satires, with sight reading. The student will be taught to appreciate the selections read as literature. Careful attention will be given to syntax and idiom, but the aim will be facility in reading. The contemporary literature will also be studied.

FRENCH AND GERMAN.—*Prof. Adams.*

The work in the modern languages will in general have the same end in view as that in Latin, and will be made an exact equivalent for the work in Latin as far as possible.

FRENCH 1, 2, GERMAN 1, 2, IV—FIRST YEAR—Careful at-

tention will be given to fixing correct habits of pronunciation together with thorough drill in forms and syntax. Constant attention will be paid to translation at sight and at hearing, and to some extent to conversation. Text-books: French; Grandgent's Shorter Grammar, Super's French Reader, Heath's Texts. German; Collar's Shorter Eysenbach, Joynes-Meissner's German Grammar, Harris' German Composition, Heath's texts.

SECOND YEAR—French 3, 4, I—Standard prose will be read, selections being taken from Dumas, Hugo, and Moliere, together with sight translations and composition. As far as possible French will be made the language of the class room. German 3, 4, I—The same general plan will be followed. Standard prose and a play of Schiller will be read, German being the language of the class room.

HISTORY, CIVICS AND PHILOSOPHY.

HISTORY 1, 2, III—*Freshman Year*—History of England. Green's Short History will be made the basis of the work, but the laboratory method will be followed. Especial stress is laid upon the development of institutions and constitution, the relation of cause and effect and the unity of history. Original sources will be consulted as far as possible. A thesis is required.

HISTORY 3, 4, II—*Sophomore Year*—American history throughout the year. After a brief survey of the colonial period a detailed study is made of the formation of the Union and the political and constitutional history of the United States. Letters and speeches of American statesmen, public documents and special histories will constitute the basis of the work. A thesis is required.

ECONOMICS 1, 2, II—*Junior Year*—Political Economy and Civics. The historical method is used and the *subject* rather than any one writer's presentation of it is treated. The instruc-

ion includes recitations, prescribed collateral reading, class room discussion, with occasional lectures. Much attention is paid to the discussion of practical cases while the subject of banking and finance is fully treated. Thesis and review exercises are required.

PSYCHOLOGY 1, I—*First Semester*—Lectures, recitations, and collateral reading, with special consideration of the subject as applied to teaching. Text-book: James' Briefer Course.

—*Prof. Woodward.*

HISTORY OF EDUCATION—PEDAGOGY 1, I—*Second Semester*—Lectures giving a brief but comprehensive outline of the school system of ancient, mediaeval, and modern countries, with special study of leading educators, such as Socrates, Comenius, Pestalozzi, Froebel, Mann, etc. The course will also cover the present trend of pedagogical thought and practice including methods of teaching and school management.

—*Prof. Adams.*

SPANISH.—*Mrs. Aguirre.*

A thorough course of instruction in Spanish grammar and in reading, writing, and speaking the language.

SPANISH 1, 2, IV—*Freshman Year*—De Tornos' Combined Spanish Method is used as the basis of the work. Much attention is given to writing and speaking Spanish. During the latter part of the year selections from *Cartillas Historicas* are read.

SPANISH 3, 4, I—*Sophomore Year*—The aim of this course will be to teach the student to read and speak the Spanish language with a fair degree of fluency. Much practice in composition and letter writing will be given and various selections from different authors read in class. Spanish will be the language of the class room.

MATHEMATICS.—*Prof. Woodward.*

It is the aim of the work in mathematics to train the student to the habit of logical and vigorous courses of reasoning, to show the wonderful breadth of application of higher mathematics, to display the beauties and pleasures of the demonstrations, methods, and results of higher geometry and calculus, and to give such practice in the use of these agents as will enable students who pursue the higher branches of engineering to use them naturally and easily in those multitudinous applications where they are indispensable. The courses in mathematics depend upon each other to such an extent that they can be taken only in the order in which they are printed.

MATHEMATICS 1, 2, III—SOLID GEOMETRY—One-third freshman year. Text-book: Phillips and Fisher's Elements of Geometry.

TRIGONOMETRY—One-third freshman year. Text-book: Well's Essentials of Trigonometry.

HIGHER ALGEBRA—One-third freshman year. Text-book: Wentworth's College Algebra.

MATHEMATICS 3, 4, IV—HIGHER ALGEBRA—One-third sophomore year.

ANALYTIC GEOMETRY—Two-thirds sophomore year. Text-book: Bowser's Analytic Geometry.

MATHEMATICS 5, 6, I—CALCULUS—*Junior Year*—Lectures and recitations covering differential and integral calculus, with special reference to their use in the various branches of engineering. Some notice is also taken of the modern branches of higher mathematics which are led up to and investigated by means of the calculus. Text-book; Hall's Differential and Integral Calculus.

SURVEYING 1, 2, V, VI, VII—*Sophomore Year*.—Recitations and field work using the level, compass, and transit, cover

ing the elements of land, topographical, railroad, and mine surveying. Text-book: Raymond's Plane Surveying.

CHEMISTRY.—*Prof. Forbes.*

The instruction in chemistry has two main objects in view—first, to promote general culture; and second, to introduce students to technical work, especially in mining. The first year's work in general chemistry and qualitative analysis places the student in an advantageous position to take up the study of mining and metallurgy.

CHEMISTRY 1, 2, V, VI, VII—GENERAL CHEMISTRY—*First Semester—Sophomore Year*—The subject is introduced by a course of lectures and experiments by the instructor, and this is supplemented by recitations and laboratory practice. Emphasis is laid on the laboratory work, and special effort is made to secure its full value both as a source of information and as a means of training students in habits of careful observation and skillful manipulation. Text-book: Remsen's Briefer Course.

QUALITATIVE ANALYSIS—*Second Semester—Sophomore Year*—This subject is pursued with careful attention both to the principles of the science and its technical execution. At the end of the course a fairly bright student is expected to be able to determine the composition of any unknown substance submitted to him for examination. Text-book: Eliot and Storer's Qualitative Analysis, and various reference books.

CHEMISTRY 3, 4, V, VI, VII—QUANTITATIVE ANALYSIS—*Junior Year*—This course has technical value in connection with the mining and metallurgical courses besides training the student in habits of thorough and accurate work.

PHYSICS AND MECHANICS.—*Prof. Woodward.*

PHYSICS AND MECHANICS—*Senior Year—First Semester.*—Lectures, recitations, laboratory work, and drawing. Mechanics of solids, liquids and gases; statics and dynamics; elementary

graphical statics applied to simple roof and bridge trusses with dead, moving, wind, and snow loads; friction and efficiency of machines.

Second Semester—Heat and a study of the steam engine. A knowledge of calculus is necessary for this course. Text-books: Hall & Bergen's Physics and Trautwine's Engineer's Pocket-Book.

BIOLOGY.—*Prof. Toumey.*

In addition to the elementary work provided in the preparatory course, as elsewhere stated, this department offers three lines of work, viz: botany, zoology, anatomy and physiology.

BOTANY 1, V, VI, VII—The preparation for the work in botany consists of the course in elementary biology given in the preparatory department, or its equivalent. The work is of elementary character, covering in a general way the histology, physiology, morphology, and systematic relationships of the more important types of plant life. The instruction is in the form of laboratory work with occasional lectures covering the subjects under investigation. Bessey's Botany, advanced course is used as a text-book, supplemented by the following as necessary reference books: Gray's Structural Botany, Sach's Physiology of Plants; Goebel's Outlines of Classification and Special Morphology. The botanical library contains the more important literature bearing upon the systematic botany of this region.

ZOOLOGY 1, V, VI, VII—In the course in zoology attention is given to the principles of classification; the structure and development and the comparative anatomy of types of animal life. Considerable time is occupied in laboratory work, making dissections and in microscopical study of animal histology. Orton's Comparative Zoology is the text-book in use.

ANATOMY AND PHYSIOLOGY, 1, V, VI, VII—One full course is given in human anatomy and physiology. That this sub

ject may be represented in a creditable manner the laboratory is provided with articulate and disarticulate human skeletons, casts representing the vital organs and numerous charts. Martin's Human Body, advanced course, is used as a text book, the daily recitations being supplemented by lectures and laboratory investigations.

In addition to the courses as given above, this department offers facilities for more advanced work or original research in botany to those qualified to pursue the same.

MINERALOGY AND GEOLOGY.

MINERALOGY AND ASSAYING, 1, 2, V, VI, VII—*Junior Year*—A year's course of lectures, recitations, and laboratory work covering (a) crystallography, (b) blow-pipe analysis and determinative mineralogy, and (c) fire assaying. At the end of the course the student is expected to know at sight all the common ores and minerals, and to be able to determine and classify, by the use of the blow-pipe and a few simple reagents, any less common mineral he may meet. A study is also made of the occurrence, uses, and distinctive characters of the most important minerals.

—*Prof. Guild.*

METALLURGICAL CHEMISTRY 1, 2, V, VI, VII—*Senior Year*. This work is intended to fit the student accurately to make determinations of gold, silver, and lead in bullion, ores, and furnace products, by the furnace method, and to become familiar with the standard methods used in this country for the determination of all the metals of economic metallurgical importance. The course also includes instruction in the complete analysis of alloys, ores, slags, mattes, etc. The text-books required are Fresenius' Quantitative Analysis or some similar standard work, and Furman's Manual of Practical Assaying.

—*Prof. Guild.*

GEOLOGY 1, 2, IV—*Senior Year*. Lectures, recitations and examination of specimens from the large collections in the

museum, covering the subjects of dynamic, historical, and economic geology. Text and reference books: Dana, Le Conte, Geike.

—Prof. Blake.

DRAWING AND SHOPWORK.

The drawing course is designed to be helpful to the study of the arts and sciences wherever graphic representation of the subject is possible. Historical ornament is studied in connection with the history course. Sketches of apparatus are made in connection with the courses in physics and chemistry. Accurate instrumental drawings are made of the exercises in the courses of geometry, descriptive geometry, shop work and all the branches of engineering. The application of useful drawing is thus apparent at every stage of the student's development.

DRAWING 1, 2, II—*Freshman Year*—Drawings involving plane and solid geometry, shop drawings, tracing, geographical drawing preparatory to plain surveying.

DRAWING 3, 4, III, IV—*Sophomore Year*—Descriptive geometry, scenographic projection. Free hand sketching of simple outlines from observation, memory and original ideas.

DRAWING 5, 6, III, IV—*Junior Year*—Graphics, civil and mining engineering drawings, architectural drawing, stereotomy.

SHOP-WORK 1, 2, VI, VII—*Freshman Year*.—The purpose of the shop-work is to furnish the student a knowledge of the principles involved in wood and metal manufactures. It is the aim to make the shops particularly useful to the mining course. The student learns by experiment the necessity of the details and technical terms of the modern shop. All work is executed from drawings and as far as possible the conduct of the shop conforms to the most approved shop practice of the day.

AGRICULTURAL COURSE.

FRESHMAN YEAR—English, Solid Geometry, Trigonometry, Higher Algebra, Modern Language, Shopwork and drawing.

SOPHOMORE—Higher Algebra, Analytic Geometry, Meteorology, Chemistry, Surveying, Botany, Drawing, Farm Equipment, Soils and Irrigation.

JUNIOR YEAR—Farm Crops, Breeds of Live Stock, Botany, Anatomy, Zoology, Entomology, Floriculture, Landscape Gardening, Forestry, Horticulture.

SENIOR YEAR—Stock Breeding and Feeding, Dairying, Veterinary Medicine, Geology, Fruits and Fruit Culture, Vegetables and Vegetable Culture.

SPECIAL COURSES.

In addition to the foregoing regular courses the special courses enumerated below have been established by the Board of Regents in response to the demand for them.

SHORT COURSE OF INSTRUCTION IN ASSAYING.

In order to meet the needs of many young men who are desirous of learning the art of assaying the common ores and metals, and who are not able to give the time required in the full course of study for graduation and the degree of mining engineer, the Board of Regents has approved of a short course of instruction in practical assaying, metallurgy, etc., to be given in the laboratories and mill.

This course commences with the first college term in each year and requires at least two years of time, but students are advised to take the full regular course in engineering and mining, if possible, since in two years they cannot expect more than to make a beginning in these subjects.

REQUIREMENTS FOR ADMISSION.

Young men desiring to take this course are required to be at least eighteen years of age, to have good health, and to have a sufficient knowledge of English and arithmetic. They must agree to observe the rules and regulations of the University.

Instruction is gratuitous, but each student is required to pay the regular entrance or matriculation fee of five dollars, and to pay the cost of materials, glassware, and apparatus used by him. For this purpose a deposit of ten dollars will be required each term in advance, and any balance will be refunded.

If for good reasons students are unable to enter at the commencement of the year, they may be received at a later date, upon passing a satisfactory examination upon the studies already passed over by the other students in the course.

Experience with special students in assaying during their stay in the University, and observation of their careers after leaving the institution have shown the following course of study to accomplish fair results with bright students.

Although the right is reserved to require this course of study of those special students who are in full attendance, it may be varied according to the aptitudes or necessities of those concerned.

TWO YEARS COURSE IN ASSAYING.

FIRST YEAR.

General chemistry ($1\frac{1}{2}$ terms); Qualitative analysis (1 terms).

Mathematics (3 terms).

English or Spanish (3 terms).

Practical free-hand drawing and shop-work (3 terms) or
Physics (3 terms).

SECOND YEAR.

Mineralogy and blow pipe analysis (2 terms); Fire assaying (1 term).

Quantitative analysis (1 term); wet assaying (2 terms).

Mathematics (3 terms).

Geology (2 terms); Economic geology (1 term).

TEXT-BOOKS.

The following text-books and others are used:

Chemistry—Remsen, Eliot & Storer, Fresenius and others.

Assaying—Ricketts, Brown, Furman, Aaron.

Mineralogy—Dana, Brush's Determinative Mineralogy.

Dana's How to Study Minerals.

Geology—Dana, LeConte, Geikie.

COMMERCIAL COURSE.—*Prof. Summers.*

In order to meet the present demands, it is thought best to establish a two years' course in the following Commercial Branches: Bookkeeping, taught by the modern budget system, Commercial Law, Commercial Arithmetic, Business Correspondence, Commercial Geography, Civics, Spelling and Penmanship.

The course offered is thorough in all the details of office practice. The system that we now use and the methods which we employ will eminently fit the students for thorough, intelligent accountants and for citizenship.

Typewriting and stenography may be pursued simultaneously with the regular commercial branches and upon the completion of both a certificate setting forth the fact will be granted.

SUB-COLLEGIATE DEPARTMENT.

In this department the University carries on the work of a model High School, with the added advantages of the shopwork and drawing of the manual training department.

Students of sufficient age who have finished the study possible to them in their home schools are enabled to continue their preparation for college, at the University, under most favorable circumstances.

The splendid equipment of the scientific laboratories is available for use in this sub-collegiate work, wherever it can be used advantageously, thus rendering strong work in elementary science possible.

The instructors in this department are assisted by the professors of the college department, several of whom regularly conduct sub-collegiate classes.

By reference to the course of study, which follows, it will be seen that it offers a comprehensive curriculum for those who may not be able to pursue their studies beyond this, while it gives a good preparation for college.

Especial attention is called to the manual and industrial features of the course whereby students of either sex may receive instruction in the principles of industrial drawing, while the shops and laboratories afford the young men an excellent opportunity to study practical mechanics and assaying.

Arrangements are being made to introduce a course in domestic science for the young ladies, which shall embrace at least instruction in plain sewing, dress making and cooking. The general usefulness of manual training is no longer a matter of doubt. Whenever there is a wise coordination of instruction in manual and in scholastic work, the product is an education by which its possessor is fitted for profitable and efficient service in the realm of business activity.

To each student who completes the studies of this course, a certificate stating that fact will be given, which certificate will entitle the holder to admittance to the higher courses of the University without examination.

SUB-COLLEGIATE COURSE OF STUDY.

Numerals indicate number of recitations per week.

FIRST YEAR.		SECOND YEAR.		THIRD YEAR.	
Algebra	5	Algebra	5	Geometry	5
English	5	English	2	English	3
Elementary Science	5	History	3	Civics	2
Drawing	4	Latin, or	} — 5	Latin,	} — 5
Shopwork	6	German, or		German,	
		French, or		French, or	
		Biology and Chemistry		Physics	
		Drawing	4	Drawing	4
		Shopwork	6	Shopwork	6

AGRICULTURAL EXPERIMENT STATION.

STATION STAFF.

WILLARD M. PARKER.....	President.
J. S. PARSONS.....	Director.
JAMES W. TOUMEY.....	Botanist.
ROBERT H. FORBES.....	Chemist.
J. McCLATCHIE.....	Agriculturist and Horticulturist.
M. WOODWARD.....	Meteorologist.
MARK WALKER, JR.....	Assistant Chemist.
ANGUS MCBRIDE.....	Stenographer.

ESTABLISHMENT AND OBJECT.

The Agricultural Experiment Station is established according to an Act of Congress, and by the Territorial Legislature has been made a part of the University.

The function of the station is to aid in developing the agricultural and horticultural resources of the Territory, by solving as completely and rapidly as possible some of the complex problems with which the farmers, fruit growers and stock raisers are confronted. In aid of this the national government has appropriated the sum of \$15,000 to be paid annually to the Board of Regents for this specific purpose.

The lines along which the work of the station runs embrace the investigations of the conditions of climate, soil, and water supply in the various parts of Arizona, and the adaptability of the conditions found to the growth of different agricultural and horticultural crops; the range of climate suited to the production of these crops; the maximum, minimum, and mean amount of water; the successful cultivation of different farm and garden crops; water storage and the development of water from other sources; the best means of applying water; methods of culture; the best season for planting; breeds of farm animals and their improvement to meet local conditions; the introduction of new fruits, vegetables and farm crops, and the distribution of plants and seeds; the development of forest tree culture; the investigation of diseases affecting the plants and animals of the territory, and the remedies best suited to prevent or eradicate them; the publication of bulletins upon investigations undertaken, and the results obtained. These bulletins are issued periodically and sent free to all who apply for them. The range of the work of the station is only limited by the needs of the territory, and the funds available for use in making the investigations. Those questions which are thought to be of greatest importance to the territory come first in the line of work pursued.

To further the ends of the station, in extending its usefulness, the co-operation of all interested in its work is earnestly solicited. Suggestions will be gratefully received and inquiries answered cheerfully, wherever possible, by the members of the staff, each for his own department. No charge is made for answering these questions, and when qualitative chemical analyses or other investigations, of general public interest and benefit are requested, they will be undertaken if possible, and without cost. For quantitative analysis, involving more labor and expense, a small charge is made.

The location of the experiment station at the University is of great benefit, directly and indirectly, to the students in the University. The specialists in the station work are available as professors in their respective branches in the University, thus affording a larger corps of teachers specially equipped in the several departments. The station investigations also provide opportunities to students in agriculture and other special branches, for the study of special conditions and methods of peculiar interest to the territory, which would not otherwise be available.

All communications respecting station matters should be addressed to:

DIRECTOR EXPERIMENT STATION,

Tucson, Arizona.

THE ARIZONA SCHOOL OF MINES.

In addition to the facilities for general instruction in the arts of mining, metallurgy and assaying, this department of the University is provided with a mill for working ores in large or small quantities from a few pounds weight to a ton or more. Mill tests can be made by either the small three stamp mill or by the large five stamp battery. There are rolls for roller crushing, and jigs and Rittinger tables for concentrating ores.

SCHEDULE OF RATES FOR ASSAYING AND WORK- ING ORES.

In accordance with the Legislative enactment approved March 3rd, 1899, the rates for assaying heretofore in force under the law of March, 1897, have been changed. The fifty-cent rate is no longer in force. Former circulars and schedules of rates, are revoked and withdrawn. Under the provisions of the new law, the Regents of the University of Arizona have established the following rates for assaying ores taken from deposits and mines in the Territory of Arizona:

ASSAYING ORES FROM ARIZONA.

Silver and Gold, or either.....	\$1.00
Silver, Gold and Copper.....	2.00
Copper.....	1.00
Lead... ..	1.00
Zinc.....	1.00
Iron.....	1.00
Gold, Silver, Copper and Lead.....	2.50
Gold, Silver, Copper and Iron.....	2.50
Gold, Silver, Copper and Zinc.....	2.50

All assays are made in duplicate and in the most careful and thorough manner.

The following rates have been established by the Board of Regents for assaying ores taken from deposits or mines without the Territory of Arizona:

ASSAYING ORES FROM WITHOUT THE LIMITS OF ARIZONA.

Silver and Gold, or either alone.....	\$1.00
Copper.....	1.00
Lead.....	1.00
Zinc... ..	2.50
Iron.....	2.00
Silica.....	1.50
Alumina.....	5.00

And for other determinations such rate as the Director of the School of Mines may in each instance fix.

PAYMENT IN ADVANCE REQUIRED.

The Director is required, in all cases, to hold the assay until the fee or charge therefor is paid. Remittances may be made by check or money order; or the money, securely wrapped may be sent with the sample.

RATES FOR SAMPLING AND WORKING ORES.

Lots of 100 pounds or less, including assays of three metals.....	\$ 5.00
Each additional 100 pounds, to 500 pounds.....	1.00
Over 500 pounds, to 1 ton.....	10.00
Each additional ton.....	4.00
Ordinary Stamp Mill test and plate amalgamation, for first ton or fraction of a ton.....	20.00
From 1 to 2 tons.....	30.00
Pan Amalgamation, including crushing and as- says, ton.....	20.00
Large lots proportionately less; small lots more in propor- tion.	

CYANIDE PROCESS.

The School of Mines is prepared to make experimental tests of ores and of tailings by the cyanide process, in large or small quantities, at rates to be agreed upon with the Director.

Working tests and experiments by other processes may be undertaken at rates to be agreed upon in each instance, depending upon the amount of materials, time and labor required.

CONCENTRATING (INCLUDING ALL ASSAYS).

Wet or dry test of small lot (under 500 pounds)	\$15.00
500 pounds to 1 ton.....	20.00
Each additional ton.....	7.00

QUALITATIVE TESTS.

The determination of the nature of rare and peculiar minerals, not requiring a chemical analysis, or an assay, is made gratuitously. Samples sent for this purpose should be in their original condition, as broken out and not crushed to a powder or pulp. Tests requiring determination of the presence of gold or silver must be paid for at assay rates. Samples may be sent by mail at the rate of one cent per ounce. They should be distinctly labelled inside of the package by the name of the sender, and a letter should be posted at the same time giving the full name and address, and enclosing a stamp for the reply. This offer of free examination is intended to apply to minerals unknown to the sender and does not cover special tests for precious metals or for any metal the presence of which is usually determined by an assay.

HOW TO SEND SAMPLES.

For small samples, under four pounds in weight, the most expeditious and cheapest way is to send by the ordinary mail. If samples or letters containing the postal order are sent by registered mail, a delay of from one to three days is caused, a notice of arrival is given first and then the registered parcel must be sent for. A similar delay results from sending by express. The express company does not deliver parcels at the University. Delays often result from the want of identification. Sometimes the only clue to the name of the sender is the comparison of the handwriting upon the sample and that upon the letter. The postal laws permit the name of the sender to be written and enclosed in the package. Each sample should be labelled by a slip of paper, inside, giving the name and locality of the claim and the address of the sender.

The name of the claim is desired in order that the value and distribution of the mineral wealth of the Territory may be better known.

Special rates of freight on consignments to the "DIRECTOR OF THE SCHOOL OF MINES," are granted by the Southern Pacific R. R. from points in Arizona. Ask the agent at shipping point for particulars.

All business communications, checks and money orders should be addressed to the

ARIZONA SCHOOL OF MINES,
WM. P. BLAKE, DIRECTOR.

TUCSON, Pima Co., Arizona.

THE TERRITORIAL MUSEUM.

The Arizona Legislature, Session 1893, passed an Act establishing a general Museum at the University. The object of this is to collect materials of all kinds illustrating the resources and development of the region, and particularly to preserve historical relics, including those pertaining to the aboriginal inhabitants.

Donations of specimens and collections will be received and acknowledged with thanks; but no provision has yet been made by the legislature for the support of this department, aside from the appropriation of \$100 per annum for the salary of a curator for two years.

A collection has been bequeathed by the late Edward Rose, of Pleasant Valley, Gila county, and the nucleus of additional collections will come from duplicates of the material obtained by members of the faculty in their annual tours of scientific investigation in the territory. The collection of minerals made by Mr. Sorin, at the World's Fair, in 1893, is also placed with the foregoing. Historical records of much value are gradually accumulated as a part of this museum, and an appeal is made to

old settlers and others to bear this fact in mind when making disposition of articles bearing even remote relation to the early pioneers and their history. All records and data of any nature which can be gleaned are worthy of preservation, and we earnestly desire to have them placed at the University where they will always be accessible for reference.

A large and valuable collection of skins of the birds of Arizona has been deposited by Mr. Herbert Brown in the museum.

It is desired to make the collection of ores and minerals fully represent the great mineral resources of Arizona, and specimens from all of the mines will be thankfully received and acknowledged.

All business communications should be addressed to

HERBERT BROWN, Curator.



SPECIAL NOTICE.

Reduced Railroad Rates to and from the University.

The Southern Pacific, the Maricopa, Phoenix & Salt River Valley Railway Company, the Santa Fe, Prescott and Phoenix railway, and the G. V. G. & N. railway from Bowie to Globe, have all generously allowed students in attendance upon the University, half rates when journeying to and from their homes. In the case of students coming to the University these half rates may be secured by notifying the president of the University a sufficient length of time in advance to enable him to secure from the proper authorities the permits. Students at the University may secure transportation to their homes and return at any time by making application at the office of the president of the University.

The railroad authorities have very kindly supplied a quantity of blanks to be filled out and presented to the proper ticket agents. It is hoped and expected that like concessions may be secured over all the roads in the territory, as students may desire to travel over various lines in coming to the University.

THE TUCSON STREET RAILWAY.

Street cars make frequent and regular trips to the University grounds from the business center of the city, affording convenient transportation to and from the University.

MILITARY ORGANIZATION, 1898-99.

Commandant of Cadets, PROF. FRANK YALE ADAMS.

COMPANY A.

Captain and Military Instructor.....	Charles Pierce Richmond
1st Lieutenant.....	Rudolph Castaneda
2nd ".....	George Millard Parker
1st Sergeant.....	William Pennypacker Reid
Sergeant.....	Philip Matthew Reilley
".....	Charles Signor Stout
".....	Lee Hickerson Orndorff
".....	Arnold Schmid
Corporal.....	James Newton Robinson
".....	Lester Albert Steinfeld
".....	Allen Chartan Bernard
".....	George Martin

Chief Trumpeter.....	Stephen Sosa McKenna
Musician Corporal.....	Henry E. Castaneda

ALUMNI ASSOCIATION.

Organized June 2nd, 1897.

CONSTITUTION.

In order to promote the interests of the University, to

secure unity among its graduates, and to foster an attachment to our Alma Mater, we do hereby constitute ourselves an association to be known as the *ALUMNI ASSOCIATION OF THE UNIVERSITY OF ARIZONA*.

I.

All persons who have received a degree from the University of Arizona are members of this association.

II.

All members of the faculty are honorary members of this Association.

III.

The officers of this Association shall be a president; one vice-president from each successive group of five classes, provided that when the last group shall number three classes it shall thereafter be entitled to a vice-president, a secretary and a treasurer.

IV.

There shall be an executive committee to consist of the following persons: The secretary and treasurer of the association, and three others chosen by the association, one of whom shall be designated as chairman of the committee.

V.

It shall be the duty of the executive committee to arrange the programmes for Alumni Day and other public occasions, to regulate the finances of the Association, to perform such other duties as may be imposed upon them, and to attend to all business of the Association not otherwise provided for.

VI.

The president shall be ex-officio a member of all committees. At each annual business meeting he shall appoint a committee of two persons to audit the treasurer's accounts.

VII.

The officers and the executive committee shall be elected by ballot at the annual business meeting to be held on Alumni Day, a majority of all votes cast being necessary for election.

VIII.

Any proposition to alter or amend these articles of Association must be made at a regular meeting, and have the assent of two-thirds of the members present.



LIST OF STUDENTS 1898-99.

SENIORS.

Morton, Robert Lee.....East Randolph, N. Y.

JUNIORS.

Flood, Ida Clarissa.....Tucson
 Haynes, Felix Grundy.....Sacaton
 Miller, Eric Rex.....Phoenix
 Richmond, Charles Pierce....."
 Seargeant, John W....."
 Welles, Florence Russell.....Tucson

SOPHOMORES.

Castaneda, Rudolph.....Benson
 Ferrin, Clara.....Tucson
 McBride, William A.....Phoenix
 Parker, George Millard.....Tucson
 Steele, Edward.....Willcox

FRESHMEN.

Baker, Ellis Maria.....Spokane, Wash.
 Brotherton, Theodore Willard, Jr.,.....Los Angeles, Cal.
 Brown, Ruth.....Tucson
 Jones, Ewing Llewellyn.....Los Angeles, Cal.
 MacChesney, Nathan W.....Chicago, Ill.
 Orndorff, Seth Buford.....Tucson
 Parker, Grace Miles....."
 Reilley, Philip Matthew.....New York City, N. Y.
 Schmid, Arnold.....Bisbee
 Smith, Bessie.....Tucson
 Wakefield, Walter James....."
 Watts, Carrie May.....Congress

THIRD PREPARATORY.

Armstrong, Carrie.....Tucson
 Armstrong, Violet....."
 Culver, Emma....."
 Horn, Guy W.....Mesa

Johnson, Emma A.....	Tucson
La Chance, Ethel Alice.....	Phoenix
McKenna, Stephen Sosa.....	Tucson
Pendleton, Alexander Garland.....	Globe
Reid William Pennypacker.....	Casa Grande
Steinfeld, Lester Albert.....	Tucson
Stout, Charles Signor.....	"
Weir, Martha.....	"

SECOND PREPARATORY.

Barkley, Hassie May.....	Mesa
Bernard, Allen Chartan.....	Tucson
Brown, Owen.....	"
Castaneda, Henry.....	Benson
Cheyney, Bernice.....	Tucson
Fish, Florence.....	"
Hasselgren, Harry William.....	Tombstone
Hoff, Mary Amelia.....	Tucson
Katzenstein, Alma Fanny.....	"
Lapham, Ina O.....	"
Likes, May Arelia.....	Tombstone
Martin, George.....	Tucson
Martin, Madge.....	"
Martin, Willie B.....	"
McGuirk, Clara.....	"
Orndorff, Lee Hickerson.....	"
Potts, Lallah Zaff.....	Kingman
Richardson, Beryl.....	Tucson
Robinson, James Newton.....	Safford
Roberts, Norman John.....	Benson
Roletti, Alberti Ralph.....	Tucson
Soldini, Constance Rosalie.....	"
Wood, Gwendolyn.....	"

FIRST PREPARATORY.

Adams, Edward Rue.....	Tucson
Olney, William Thomas.....	Solomonville
Stevens, George H. Jr.....	"
Whipple, William D.....	Clifton
Wilkinson, Reuben Earle.....	Tucson

SPECIAL.

Brown, Stephen (Mining and Assay).....	Tucson
Bauman, Samuel Frank (Spanish).....	"

Barber, Fred Arthur (Algebra and Spanish).....	Newton, Mass.
Bird, Ruth Vivian (Commercial).....	Tucson
Colbath, James Sollitt (Mining).....	Holbrook
Cooley, Mrs. F. C. (French and English).....	Tucson
Doan, Frank Wilson (Mining and Assay).....	Florence
Drew, Helen (Spanish).....	Tucson
Dykes, Geo. N. (Commercial).....	Mesa
Felix, Arthur (Commercial).....	Tucson
Fleishman, Heerman Charles (Commercial).....	"
Guild, Roy E. (Commercial).....	"
Goodfellow, Emma L. (Commercial).....	"
Goodwin, Lillie M. (Commercial).....	"
Harley, Fannie (Commercial).....	Globe
Hadsell, Walter E. (Mining).....	Buckeye
Hunter, Lillian L. (Commercial).....	Mason, Texas
Hughes, Annie (Commercial).....	Tucson
Hornbeck, Charles (Commercial).....	Mesa
Leon, Antonio (Commercial).....	Tucson
Lopez, George P. (Commercial).....	"
Michea, Claude (Commercial).....	Florence
Marrin, Catherine (Commercial).....	Tucson
Merriman, Laurena (English and Physics).....	San Jose, Cal.
Montoya, Frecia (Commercial).....	Tucson
Nutter, Beatrice (Elocution).....	"
Pearce, William (Commercial).....	"
Pittock, Jennie P. (Elocution and Drawing).....	Nevilton, Pa.
Potts, Louise Francis (Commercial).....	Kingman
Reynolds, William Graham (Spanish).....	San Mateo, Cal.
Riggs, Lulu (Commercial).....	Tucson
Scholey, Edward D. (Commercial).....	Mayer
Scholey, Charles K. (Mining and Assay).....	"
Stevens, Elisa (Commercial).....	Tucson
Sullivan, Nora (Commercial).....	"
Towner, Nora (English).....	"
Trevillian, Thomas (Commercial).....	Globe
Varren, Willis J. (Mining and Assay).....	Phoenix
Whittle, Callie (Commercial).....	Tucson
Vilbur, Mary Strange (Commercial).....	"
Villiams C. D. M. (Spanish).....	"
Vinton, William R. (Commercial).....	"

UNCLASSIFIED.

amado, Alberto F.....	Tucson
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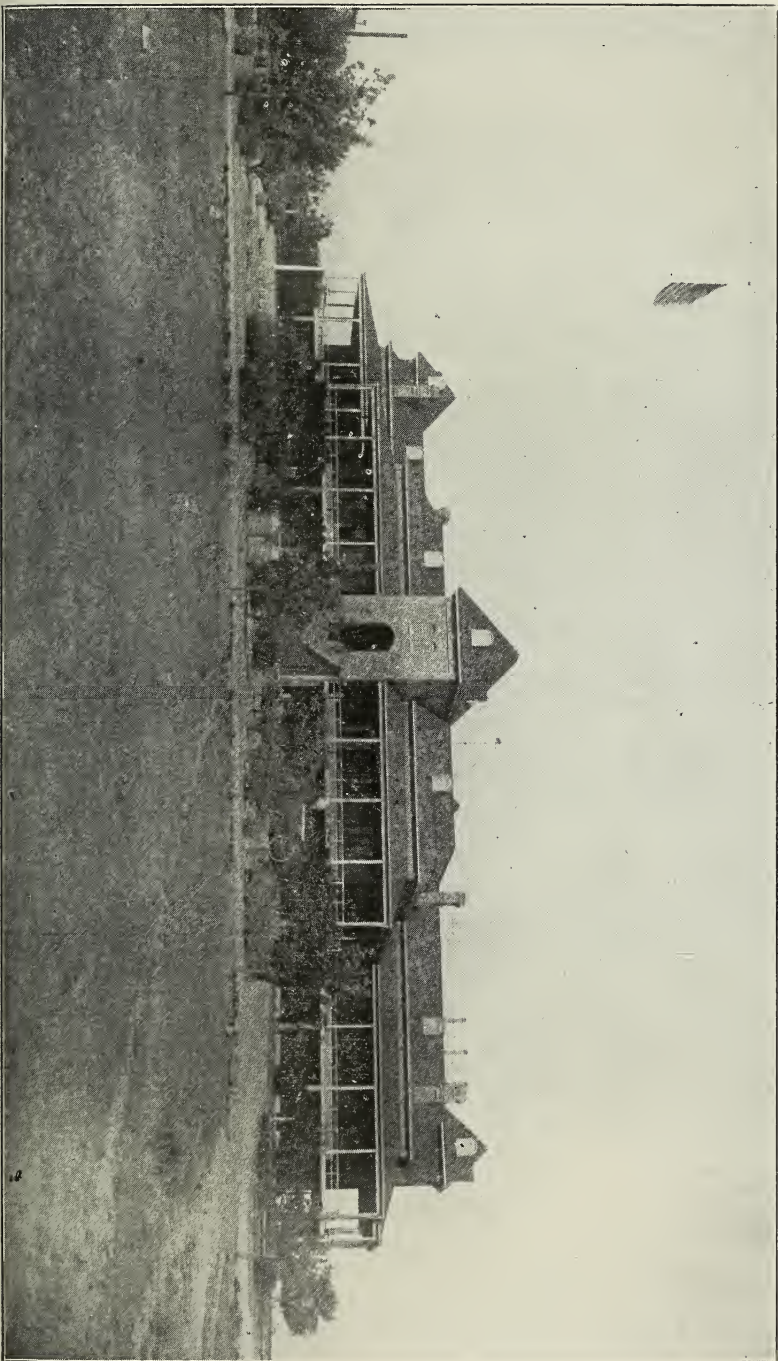
Arevalo, Miguel D.....	Tucson
Arriago, Alfredo.....	Santa Cruz, Mex
Brown, Maughs Southwood.....	Clifton
Bagley, Charles Francis.....	Mesa
Cabral, John Jr.....	La Colorada, Sonora
De la Ossa, Alberto.....	Lochiel
De la Ossa, Osbaldo.....	"
Davila, Leobaldo.....	Magdalena, Sonora
Elias, Francisco.....	Hermosillo, "
Ferreira, Jose.....	"
Fiske, Fannie May.....	Globe
Federico, Elisa C.....	Tucson
Hamilton, Loyal.....	"
Mayer, Wilbur J.....	Mayaguez
Moyer, Charles Calvin.....	Bonita
Pascoe, Benjamin Franklin.....	Thatcher
Patton, Jose.....	Redington
Reynolds, Ella Margarette.....	Tucson
Riordan, Marie Elizabeth.....	"
Steele, Fred Z.....	Willcox
Santa Cruz, Edgardo.....	Hermosillo, Sonora
Santa Cruz, Jose.....	"
Suarez, Benito G.....	Solomonville
Suarez, Conrado F.....	Hermosillo, Sonora

GRADUATE STUDENTS.

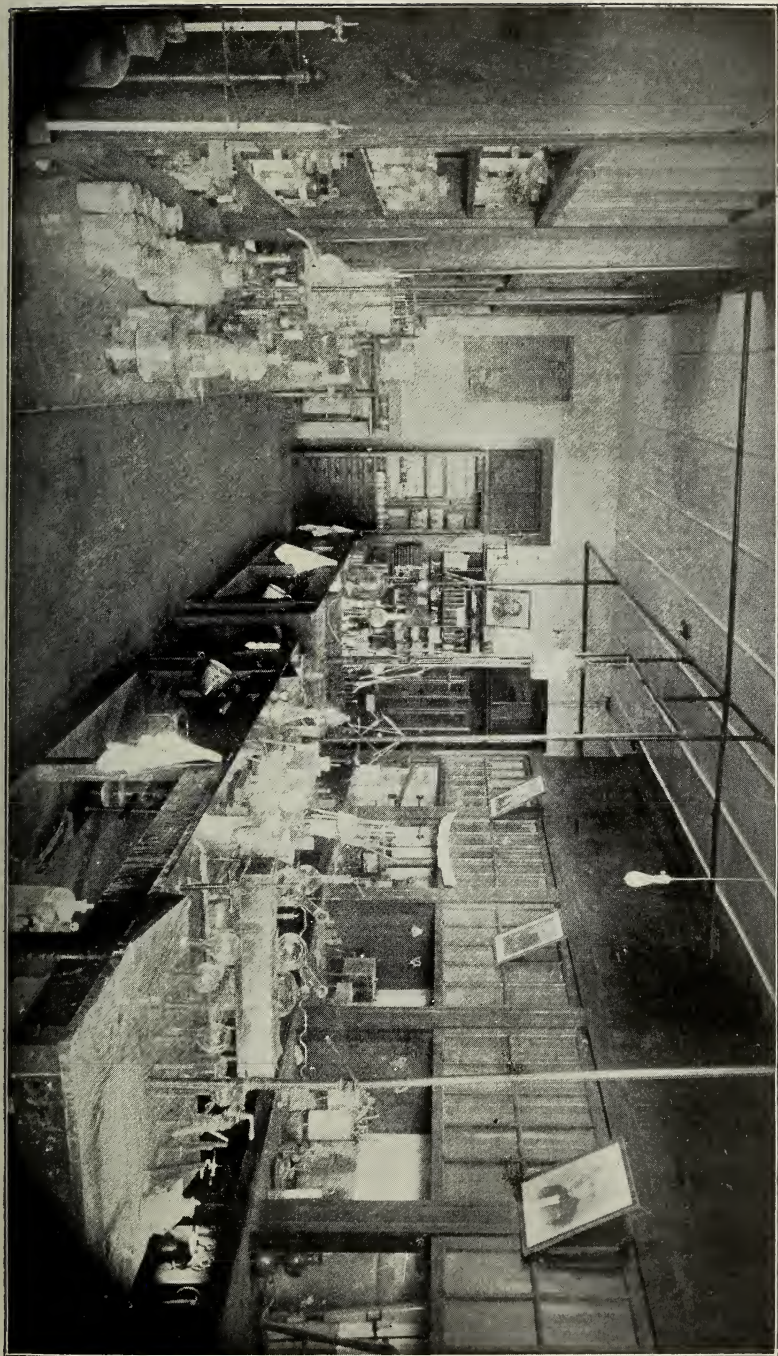
Foucar, Louisa Henriette (Botany).....	N. Woburn, Mass
Walker, Mary Flint (Commercial and Spanish).....	Tucson

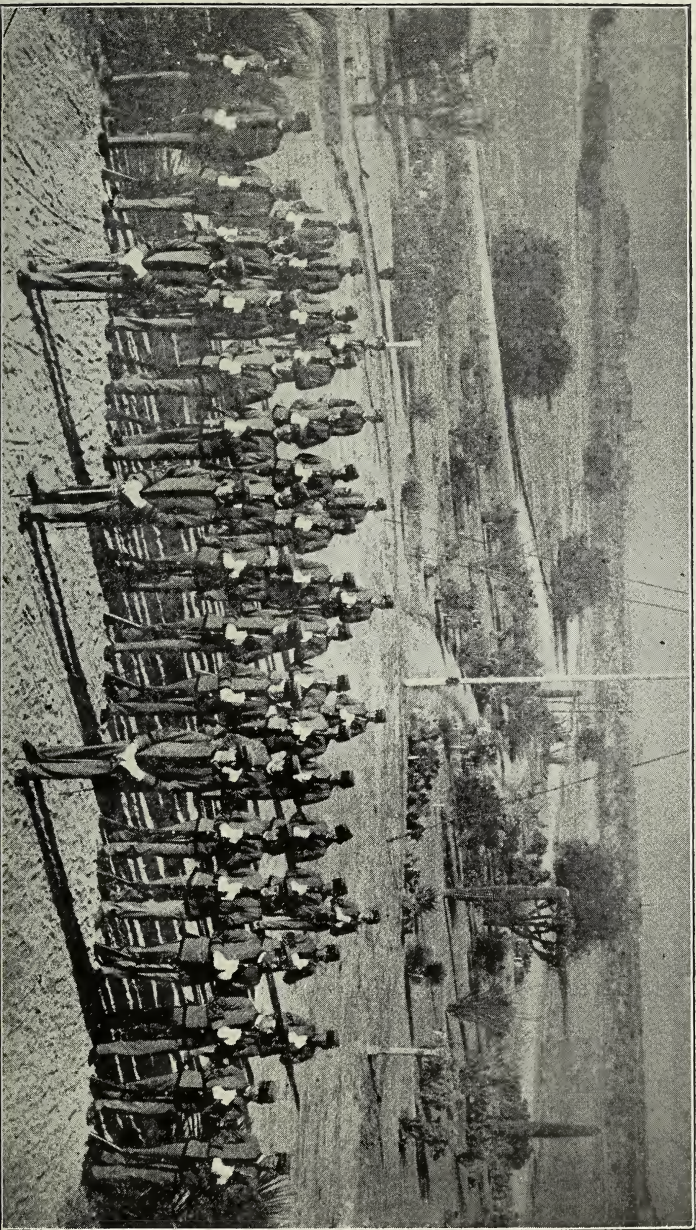
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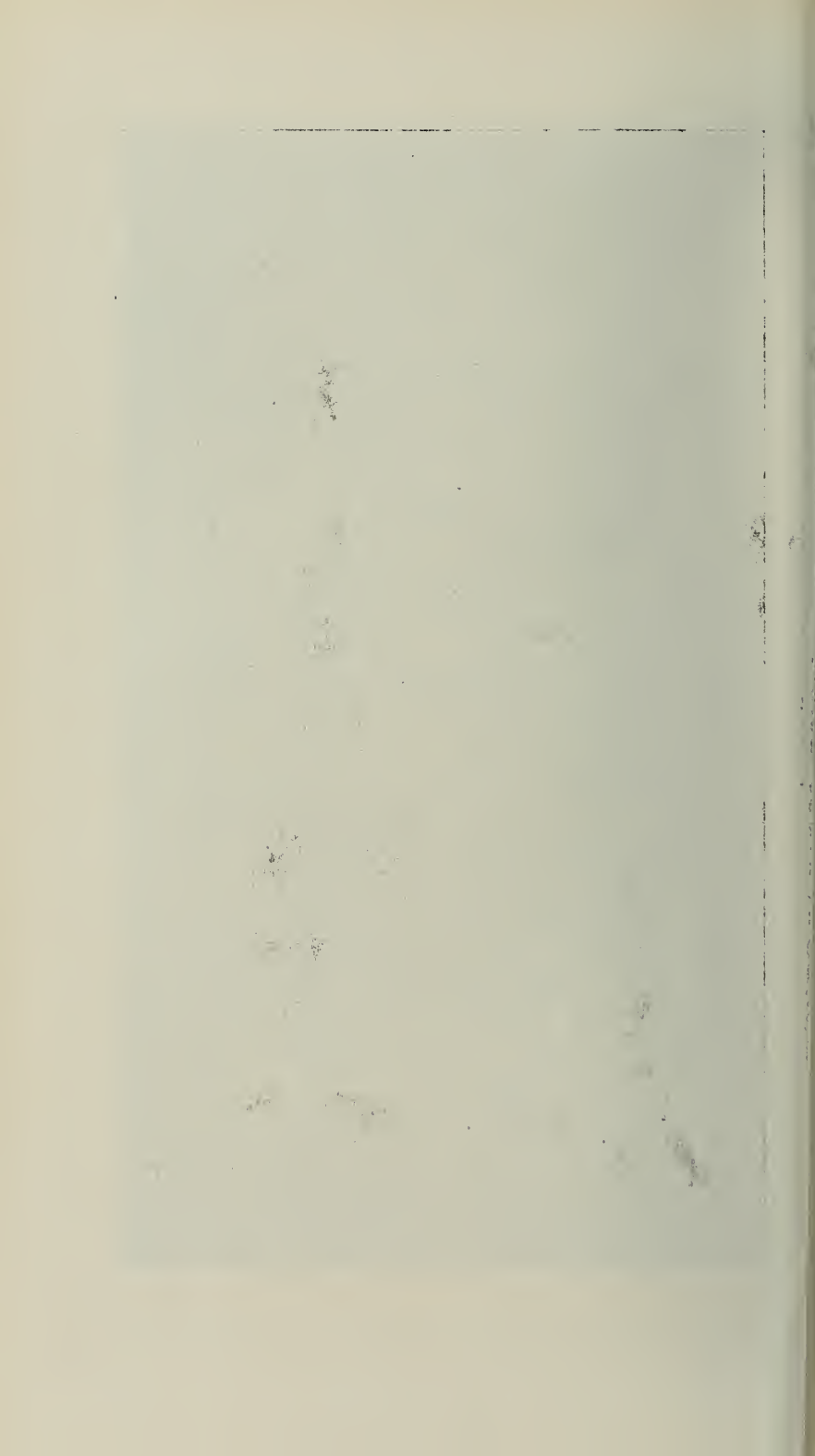


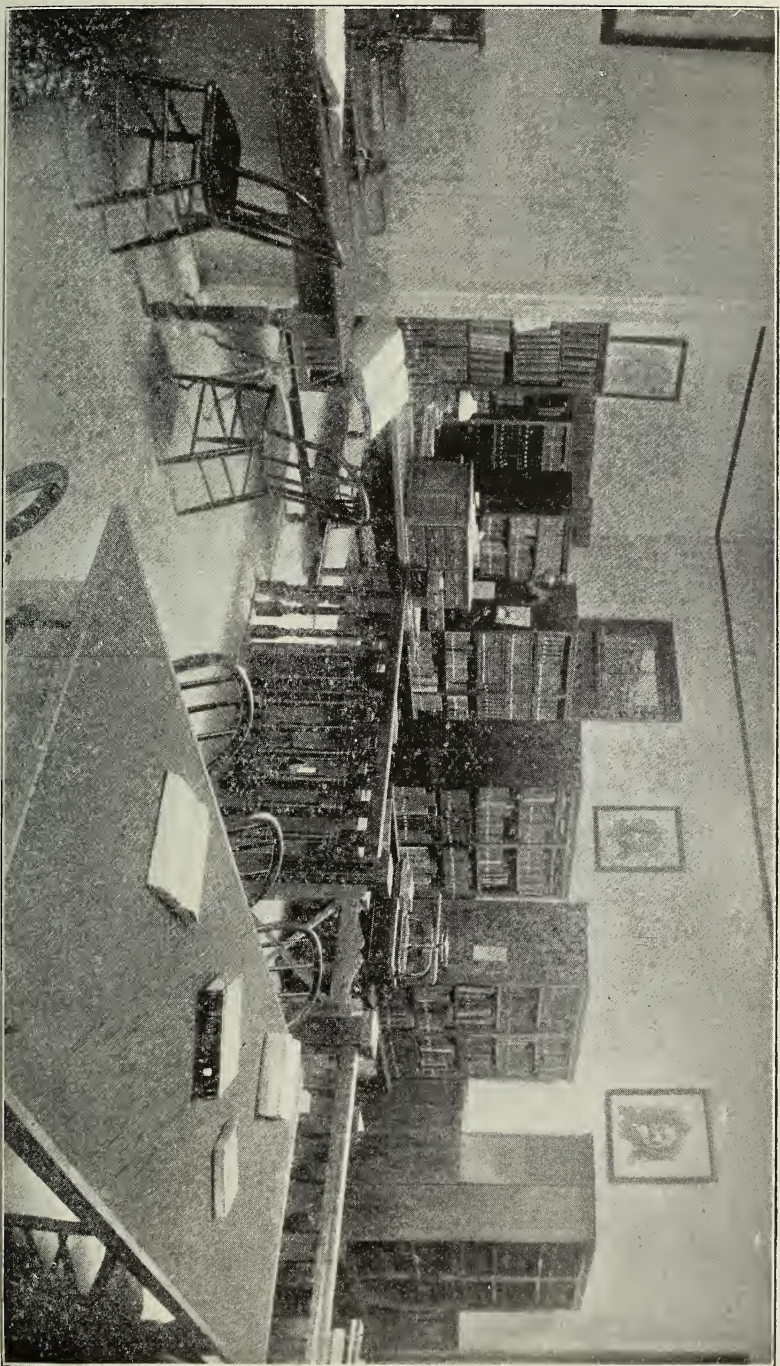




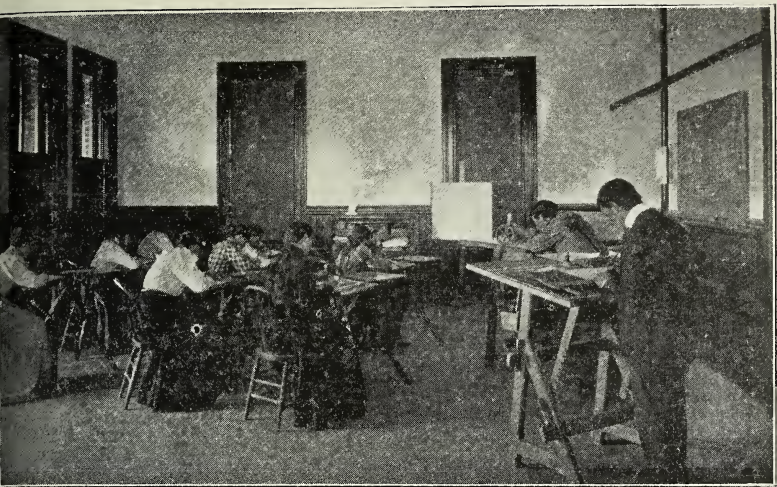


COMPANY OF CADETS.

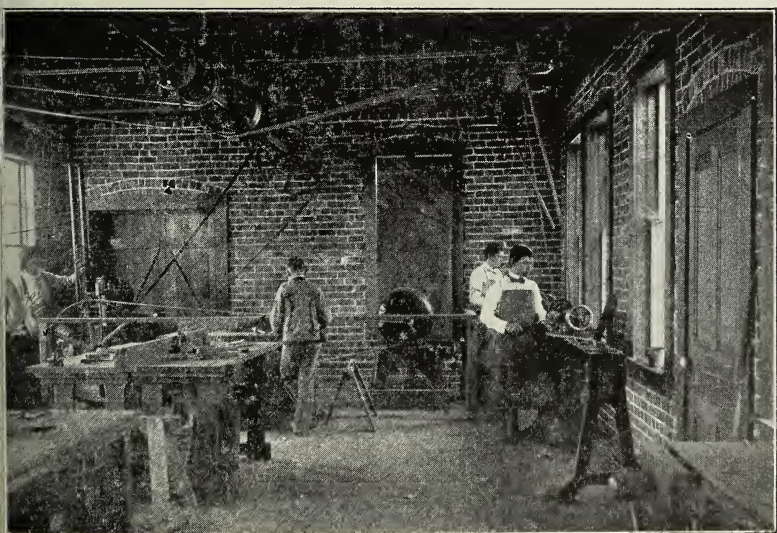




LIBRARY.



A CORNER OF DRAWING ROOM.



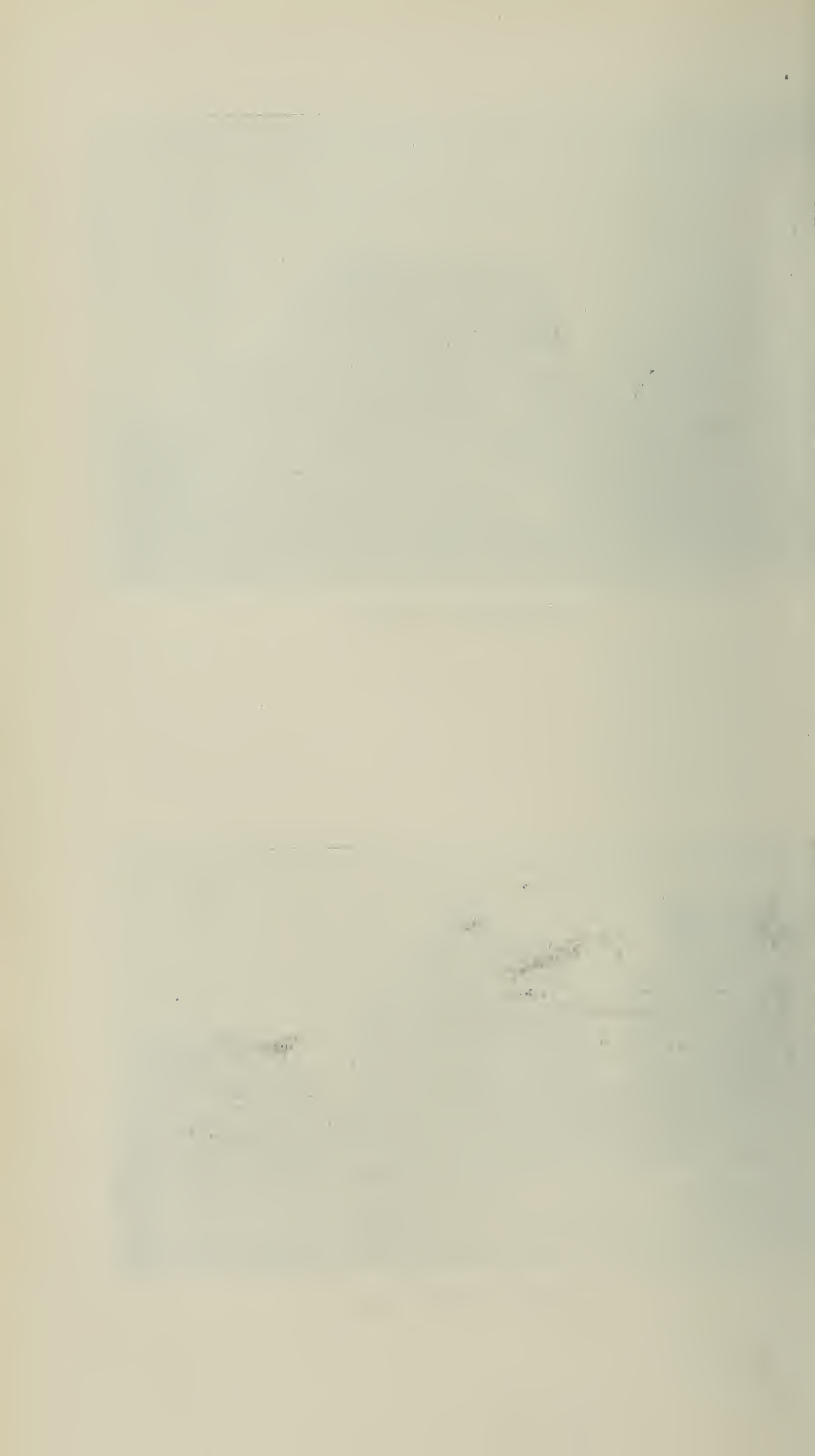
A CORNER OF CARPENTER SHOP.



PRESIDENT'S HOUSE.



LADIES' DORMITORIES.



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The
University
OF
Arizona

Ninth Annual Register

1899-1900

.. WITH ..

Announcements for 1900-1901

Tucson, Arizona

1900



The
University
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Ninth Annual Register

1899-1900

.. WITH ..

Announcements for 1900-1901

Tucson, Arizona

1900

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CALENDAR

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September 17 and 18, } Monday and Tuesday }	Entrance Examinations at University
September 19, Wednesday.....	Registration Day
September 20, Thursday.....	Recitations Begin
November 29 and 30, Thursday and Friday.....	{ Thanksgiving Recess.
December 21, Friday.....	Holiday Vacation Begins

1901.

January 2, Wednesday.....	Recitations Resumed
January 31, Thursday.....	First Semester Ends
February 1, Friday.....	Arbor Day
February 4, Monday.....	Second Semester Begins
May 30, Wednesday.....	Decoration Day
June 5, Wednesday.....	Recitations End
June 6, Thursday.....	Commencement Day

BOARD OF REGENTS.

Ex-Officio.

HON. N. O. MURPHY.....	Governor of Arizona
HON. R. L. LONG.....	Superintendent of Public Instruction

Appointed by the Governor of the Territory.

HON. WILLIAM HERRING, Esq., Chancellor.....	Tucson
HON. H. W. FENNER, M. D., Secretary.....	Tucson
HON. HERBERT B. TENNEY, Treasurer.....	Tucson
HON. CHARLES R. DRAKE.....	Tucson

OFFICERS OF INSTRUCTION AND GOVERNMENT.

1899-1900

MILLARD MAYHEW PARKER, PRESIDENT.

PROFESSOR OF CIVICS.

A. B. and A. M., Wesleyan University, Middletown, Connecticut; Principal High School, North Livermore, Maine, 1875; Principal Academy, Glastonbury, Conn., 1876-7; Principal High School, Holliston, Mass., 1877-1882; Professor Greek and Latin, Sierra Madre College, Pasadena, Cal., 1884-1886; Principal Academy, Pasadena, Cal., 1886-91; Vice President and Professor of Greek and Latin Throop Polytechnic Institute, Pasadena, Cal., 1891-1897; President University of Arizona 1897-

WILLIAM PHIPPS BLAKE, DIRECTOR SCHOOL OF MINES.

PROFESSOR OF GEOLOGY, METALLURGY AND MINING.

Ph. B., Yale University; A. M., Dartmouth College; Assistant Chemist New York Medical College 1852; Chemist and Mineralogist of the New Jersey Zinc Company; Geologist and Mineralogist of the U. S. P. R. R. Survey, 1853; Author and Editor of Reports on U. S. P. R. R. Surveys; Editor Mining Magazine and Journal of Geology 1858-60; Mining Engineer to the Government of Japan 1862-3; Professor of Geology and Mining, College of California, 1866; Commissioner of California to Paris Exposition 1867; Edited Reports of U. S. Commissioner to Paris, consisting of six volumes, in 1867-71; Chief of the Scientific Staff of the Santa Domingo Commission 1871; Commissioner for Conn., International Exposition, Philadelphia, and Chairman of Classification Committee, 1871-77; Commissioner to Vienna Exposition 1873; U. S. Commissioner to World's Fair at Paris 1878; and Secretary of Scientific Commissioners; Mining Engineer 1879-1895; Author of many contributions to Scientific publications; Territorial Geologist; Professor of Geology, Metallurgy and Mining, University of Arizona, 1895-

JAMES WILLIAM TOUMEY, PROFESSOR OF BOTANY.

BOTANIST AGRICULTURAL EXPERIMENT STATION.

A. B. and A. M., Michigan Agricultural College; Assistant Dept. of Botany Michigan Agricultural College 1890-91; Professor of Biology, University of Arizona 1891; Special Agent U. S. Dept. of Agriculture, Division of Botany Summer, 1892; Special work Harvard University, Summer 1893; Special Agent and Expert U. S. Department of Agriculture, Division of Forestry, Summer 1899; Superintendent of Tree Planting, U. S. Department of Agriculture, Division of Forestry, 1899. Professor of Botany, University of Arizona 1891.

HOWARD JUDSON HALL, LIBRARIAN.

PROFESSOR OF ENGLISH.

B. S., Michigan Agricultural College; A. B., Leland Stanford Junior University; Instructor in English, University of Arizona 1891-95; Professor of English University of Arizona, 1895; Graduate student Harvard University 1899.

ROBERT HUMPHREY FORBES.

DIRECTOR AGRICULTURAL EXPERIMENT STATION.

PROFESSOR OF CHEMISTRY.

B. S. and M. S., University of Illinois; Instructor in Chemistry, University of Illinois, 1891-93, also special assistant in Illinois Experiment Station laboratories; Fellow and special student in chemistry, Harvard University, 1893-94; Chemist Arizona Agricultural Experiment Station, and Professor Chemistry, University of Arizona, 1894-

HERMAN MELVILLE WOODWARD,

PROFESSOR OF MATHEMATICS AND MECHANICS.

M. S., Washington University, St. Louis; A. M., Harvard University; Teacher of Mathematics and Science, Rayen High School, Youngstown, O., 1893-95; Student Harvard, 1895-96; Professor Mathematics and Mechanics, University of Arizona, 1896-

FRANK YALE ADAMS, LIEUT.-COL. GOVERNOR'S STAFF, COMMANDANT OF CADETS.

PROFESSOR OF HISTORY AND PEDAGOGY.

A. B. and A. M., St. Lawrence University; Principal Academy, Naples, N. Y., 1888-90; Instructor West Point Military Academy Preparatory School, 1890-91; Principal Crown Point High School, 1891-93; Supt. of Schools, St. Johnsville, N. Y., 1893-97; Professor of Ancient and Modern Languages, University of Arizona, 1897-99; Professor of History and Pedagogy, 1899-

FRANK NELSON GUILD,

PROFESSOR OF MINERALOGY. ASSOCIATE PROFESSOR OF CHEMISTRY.

B. S., University of Vermont; Instructor in Physics and French, Chicago Manual Training School, 1894-95; Professor of Chemistry and Geology, College of Montana, 1895-97; Professor of Mineralogy, University of Arizona, 1897-

ALFRED JAMES McCLATCHIE,

PROFESSOR AGRICULTURE AND HORTICULTURE.

B. A., University of Nebraska; M. A., Olivet College; Professor Biology Throop Polytechnic Institute, 1892-96; Author of "Flora of Pasadena and Vicinity," "A Guide to the Study of Plants," "Biological Work in Secondary Schools," "Seedless Plants of Southern California"; Professor of Agriculture and Horticulture University of Arizona, 1898-

DAVID HULL HOLMES,

INSTRUCTOR SHOPWORK AND DRAWING.

Graduate St. Louis Manual Training School; Special Student Washington University; Draughtsman in Architect's office, Instructor Drawing University of Missouri; Instructor Drawing University of Colorado; Instructor Drawing University of Arizona, 1898-

MRS. MARY BERNARD AGUIRRE,

INSTRUCTOR SPANISH AND HISTORY.

Graduate of Methodist Female College, North Independence, Mo.; Private Finishing School, Baltimore, Md.; Taught in public schools in Arizona twenty years; Instructor in History and Spanish University of Arizona, 1896-

MRS. EMMA MONK GUILD,

INSTRUCTOR SUB-COLLEGIATE DEPARTMENT.

Graduate Albany, N. Y., Normal College; Assistant and Principal Public Schools Cohoes, N. Y., 1870-81; Vice-Principal Tucson Public School 1882-85; Principal Florence, Arizona, Public Schools 1885-87; Instructor in English and Mathematics, University of Arizona, 1897-

ANSEL AUGUSTUS TYLER,

ASSOCIATE PROFESSOR BIOLOGY.

A. B. and A. M., Lafayette College; Ph. D., Columbia University; Instructor Botany and Physics Easton, Penn., High School 1891-92; Assistant in Biology Lafayette College 1892-94; Graduate student Columbia University 1894-97; Instructor in Biology Union College 1897-8; Instructor in Botany, Syracuse University 1898-9; Associate Professor Biology, University of Arizona, 1899-

MARY ELIZABETH PLIMPTON, PRECEPTRESS.

ACTING PROFESSOR OF ENGLISH LITERATURE.

Student Northwestern University 1889-92; A. B. and A. M., Woman's College Baltimore; Assistant in Library and English Department Woman's College Baltimore 1893-95; Professor English Language and Literature University S. California 1899; Acting Professor English Language and Literature, Acting Librarian University of Arizona, 1899-

PAL LEBARON MCGAUHEY,

INSTRUCTOR IN PHYSICAL CULTURE AND ENGLISH READING.

B. E., Martyn College of Oratory, Washington, D. C.; Graduate of Ralston School Physical Culture; Public School Teacher Neb. and Cal. 1888-99; Instructor in Art of Expression and Physical Culture University of Arizona, 1899-

JOHN FREDERICK DABBS,

INSTRUCTOR MATHEMATICS AND BOOK-KEEPING.

Ph. B. and A. B., Missouri Valley College; Professor Greek and Latin Arkansas Cumberland College 1893-99; Instructor University of Arizona, 1899-

LOUISE HENRIETTA FOUCAR,

INSTRUCTOR IN BOTANY, MATHEMATICS AND LANGUAGES.

B. A. Lit. B., Denver University; Post Graduate student Denver University 1894-96; Instructor in Modern Languages Denver University 1894-95; Student in Europe 1896-97; Instructor University of Arizona, 1899-

MARK WALKER, JR.,

COMMERCIAL ASSAYER.

B. S., University of Arizona; Assistant Chemist Agricultural Experiment Station, University of Arizona 1897-99; Commercial Assayer 1899-

WILLIAM W. SKINNER,

ASSISTANT CHEMIST AGRICULTURAL EXPERIMENT STATION.

B. S., Maryland Agricultural College; M. S., Columbian University; Assistant State Chemist of Maryland and Assistant Chemist Maryland Agricultural College 1895-1900; Temporary Assistant U. S. Department of Agriculture, detailed on special work 1900; Member American Chemical Society; Assistant Chemist Agricultural Experiment Station, 1899-

KATHERINE K. BARKER,

INSTRUCTOR DOMESTIC SCIENCE.

Graduate Sloyd Training School and Domestic Science Department Throop Polytechnic Institute; Assistant Sloyd Department Throop Polytechnic Institute 1898-99; Instructor in Domestic Science University of Arizona, 1899-

GORDON H. TRUE, B. S.,

PROFESSOR OF ANIMAL HUSBANDRY, AGRICULTURAL EXPERIMENT STATION.

B. S., University Wisconsin; Instructor in Dairying Michigan Agricultural College 1894-1899; Professor of Animal Husbandry University of Arizona, 1899.

NORA TOWNER,

STENOGRAPHY.

CHARLES PIERCE RICHMOND,

MILITARY INSTRUCTOR.

HERBERT BROWN,

CURATOR OF TERRITORIAL MUSEUM.

LOCATION, CLIMATE, ETC.

The University of Arizona is located near Tucson, the county seat of Pima county, and one of the largest towns in the territory.

Tucson is on the main line of the Southern Pacific railway, 312 miles west of El Paso, Texas, and 500 miles east of Los Angeles, Cal. It is easily reached from east and west without change and has railway connections with the central and northern portions of the territory *via* Maricopa, and with the north-eastern states *via* Deming. The town lies in a broad, flat valley at an elevation of 2,400 feet above sea level and is surrounded by mountains. Its dry, healthful situation with its mild and equable climate has made Tucson a famous health resort, particularly for pulmonary patients.

The winter climate is especially good. Its temperature is cool and strengthening without being severe. The lowest temperature recorded during the average year is about 20 degrees above zero, Fahrenheit. But little rain falls during the winter; fogs are unknown; cloudy days are rare, the percentage of sunshine throughout the winter being greater than that recorded at any other place in the United States. Owing to the extreme dryness of the air the highest temperatures known are less oppressive to the senses and less dangerous to the health than the summer heat of the upper Mississippi valley states.

The total amount of rainfall averages less than twelve inches. Of this amount fully one-half falls during July and August; yet the amount is so small as not materially to increase the atmospheric humidity, and the summers are found to be remarkably healthy. In general the climate may be described as well suited to nearly all people, but is particularly beneficial to the young and to those who cannot endure with comfort or safety the extremes of temperature and the sudden changes of northern climates.

The University was established by an act of the Thirteenth Legislative Assembly of the Territory during the biennial session at Prescott in 1885. The bill was introduced into the council by C. C. Stephens of Tucson, carried through the house by the able efforts of S. M. Franklin and approved by the governor March 12, 1885.

A tract embracing forty acres of land lying just outside the city limits was selected as a site and was donated by the citizens of Tucson. A contract for erecting the main building was let in October, 1887, but owing to financial delays the building was not opened to students until October 1, 1891. The site selected is upon high ground about a mile from the business center of the city. On every side, it commands a view of mountain scenery of remarkable extent and grandeur. The location cannot be surpassed for healthfulness. The University possesses its own water system. The supply is drawn from a well on the premises one hundred feet deep, and is of unusually good quality.

BUILDINGS.

The main building is two hundred by one hundred five feet, two stories in height, the lower story of gray stone, the upper of red brick, and is completely surrounded by a wide two-story veranda. This building contains the offices, recitation rooms, laboratories, and apparatus rooms of the various departments; an assembly room, the libraries of the University and Experiment Station and the Territorial Museum. Adjoining the main building is the mining annex, eighty by sixty feet, filled with metallurgical machinery.

Three brick houses, two stories in height are occupied as homes by instructors and the president.

A dormitory built of a fine quality of gray stone, two stories in height, originally provided as a home for male students, has been refitted for the use of the young women. It contains a students' dining room, kitchen connected therewith, sixteen rooms, each large enough to accommodate two students, and a reception room.

A fine brick dormitory of imposing architecture, containing forty rooms, with bath and toilet rooms has been built this year for the use of the male students and teachers.

A substantial brick building contains a suite of rooms for the use of the assaying department, and also a carpenter shop. The assay rooms contain a large smelting furnace with necessary muffle furnaces and other accessories, while the carpenter shop has an engine for power work, with lathes and other machinery for convenient operation.

Other buildings are the boiler house, which also contains the well and pumps whereby the water supply for irrigation and general purposes is obtained; the new green house, eighty by twenty-one feet, built wholly of glass; the old green house, now used as a propagating house, also of glass; the cottage occupied by the classes in domestic science; and a temporary wooden building used for various purposes.

EQUIPMENT.

LIBRARY.

The library is a department of the University that is increasing in efficiency with the growth of the institution. The books have been selected with great care, with a view both to the requirements of the various departments of instruction and also to the building up of a well-balanced, symmetrical collection of books. All the books are new and standard. The scientific works represent the highest and latest authority while the literary and historical works are the writings of the best known and most thoroughly tried authors. A main object in making the selection has been to furnish students with books of the highest class and to encourage them in habits of careful reading. Complete bound sets of the leading American periodicals, both literary and scientific, are being collected every year, so that the library is already valuable as a means of research in present-day problems.

The latest editions of the best cyclopædias and dictionaries are constantly at the students' disposal. The leading American scientific and literary publications as well as the territorial newspapers are found in the reading-room. The reading-room and library are open to students for an average of eight hours each day.

The library contains about 5000 volumes. Of the whole number about three-fifths are scientific works, the remaining belonging to general literature, biography and history. A complete card catalogue of authors and titles is maintained.

THE TERRITORIAL MUSEUM.

The Arizona Legislature, Session 1893, passed an Act establishing a general Museum at the University. The object of this

is to collect materials of all kinds illustrating the resources and development of Arizona and particularly to preserve historical relics, including those pertaining to the aboriginal inhabitants.

Donations of specimens and collections will be received and acknowledged with thanks; but no provision has yet been made by the legislature for the support of this department, aside from the appropriation of \$100 per annum for the salary of a curator for two years.

The collections now displayed at the University comprise representative series of the minerals, ores and rocks of Arizona. Amongst these may be mentioned particularly superb specimens from the mines of the Copper Queen at Bisbee. There are also collections of typical rocks and minerals for comparison, and many specimens of ores from different parts of the United States and from abroad.

It is desired to make the collection of ores and minerals fully represent the great mineral resources of Arizona, and specimens from all of the mines will be thankfully received and duly acknowledged.

A large and valuable collection of skins of the birds of Arizona has been deposited by Mr. Herbert Brown, curator, in the museum.

He has also contributed largely to the Department of Archaeology, which already has a collection of ancient aboriginal pottery and other relics.

Amongst other important additions to the Museum the fossil skull and teeth of an elephant sent from Yuma by Mr. Brown deserves special mention.

Historical records of much value are gradually accumulating as a part of this museum, and an appeal is made to old settlers and others to bear this fact in mind when making disposition of articles bearing even remote relation to the early pioneers and their history. All records and data of any nature which can be gleaned are worthy of preservation, and we earnestly desire to have them placed at the University where they will always be accessible for reference.

The professors at the University have the immediate care of

the collections in their respective departments.

The Museum has attained very considerable importance and value and should be safely housed in a special museum building which it is hoped may be secured in the near future.

CHEMISTRY.

The chemical laboratories are two in number. The smaller one on the upper floor of the main building is for the use of students and is equipped for teaching the theory and practice of chemical science. The room for laboratory work is well lighted, provided with gas, water, working desks, ventilating hoods, an abundance of apparatus and chemicals with which to carry on experimental work, and can be made to accommodate about twenty-four students. Adjoining the large room is a small store-room stocked with apparatus for demonstrating the principles of chemistry and containing well selected collections of chemical substances.

The Experiment Station laboratory occupies three large working rooms and two small store rooms on the lower floor of the main building. This laboratory is devoted to analytical work and chemical investigations relating to the agricultural interests of the territory. It is excellently equipped for the special lines of investigation in which it is engaged, and although not primarily intended for the use of students, it has educational value to those who desire to witness the operations of a working laboratory. The equipment includes chemical balances, chemical apparatus and supplies, machinery for preparing samples, and special appliances for the analysis of milk, agricultural products, tanning materials, and soils.

BIOLOGY.

The biological laboratories occupy three rooms in the southwest half, second floor of the south wing of the main building. These rooms are piped for gas and water and liberally provided with apparatus for research and for giving instruction on biological subjects. Students pursuing histological work are provided without expense with simple and compound microscopes, as the nature of their work demands. The laboratory is equipped with microtomes, culture baths, oven and other accessories used in modern methods of research.

An herbarium, containing nearly ten thousand sheets of plants, mostly indigenous to the south-west, a large percentage being from Arizona, is an important factor in the equipment. Some fifty cases of insects, including one large cabinet, are of value in giving instruction in entomology and to illustrate the economic insects of Arizona. The work in general and systematic zoology is greatly facilitated by the Herbert Brown collection of birds, and by other zoological material which has been brought together during the last five years.

To aid in the study of human and comparative anatomy and physiology there are provided articulate and disarticulate human skeletons, plaster and papier-mache models of the important organs, and microscopical preparations illustrating the structure of the various tissues. The equipment also includes special apparatus for use of advanced students in the department.

AGRICULTURE AND HORTICULTURE.

Two rooms upon the first floor and near the central part of the main building are used for the work in the study of agriculture and horticulture, and for the Agricultural Experiment station headquarters. The equipment is fairly complete. There have been imported from Europe several of the best Azoux models of portions of the domestic animals, showing normal and morbid conditions; also several cases of products of the vegetable kingdom. A very large collection of garden and farm seeds has been secured and arranged in jars and properly labeled. There is also a selection of garden tools, and instruments used in veterinary surgery. Recently there has been imported from Germany a collection of charts illustrating the anatomy and physiology of some of the fruits and grains. Specimens of the best fruits, grains, and other farm products are constantly received for examination; also specimens of an abnormal nature.

The old green-house, about fourteen by twenty feet in area, is used as a propagating house, and a new one has just been built, twenty-one by eighty feet in size, constructed of glass throughout. Laboratory work is provided for in these green houses, and in field work upon the University grounds. The general library contains

many of the most valuable of the recent publications upon agriculture in its various branches, and the science upon which it is based. All the bulletins and reports of the experiment stations of the United States and foreign countries are on file in the station library, and the principal agricultural and horticultural journals are upon the table of the reading room.

ENGINEERING.

In a partly developed territory like our own the engineer is called upon for the solution of a great variety of problems in the various lines of civil, hydraulic, mechanical, and mining engineering, and in many inaccessible situations he must depend upon his knowledge and inventive ingenuity to supplement a meagre equipment. To prepare the engineering student for such experiences the apparatus in this department has been chosen with a view to giving him the greatest familiarity with the theory, construction and use of those instruments and machines which experience has shown to be of universal adoption in practical engineering work. Already liberal, it is constantly being enlarged. It embraces surveyors' and engineers' chains; standard field and pocket tapes; plain and solar compasses and transits; engineers' levels; stadia level, and transit rods; aneroid barometers; odometers; pedometers; automatic water registers; hook gauges; three forms of current meters; stop-watch; meteorological instruments; drafting instruments; mechanical calculators; blue print apparatus; a four and one-fourth inch astronomical telescope with equatorial mounting and accessories; celestial sphere; a 75-light Mather dynamo; Westinghouse high speed engine; pumps, steam gauges, indicator, calorimeters, etc.

MINING AND METALLURGY.

Attached to the main building is an annex or mill, containing machinery and appliances for crushing, sampling, concentrating, amalgamating, leaching, chloriding, cyaniding, and the electrical treatment of various kinds of ore in large or small lots. Power is furnished from a seventy horse-power boiler, detached from the main building, the steam being carried under-ground to the engine-room, which contains a thirty-five horse-power engine.

built by the Walburn-Swenson Manufacturing Co., of Fort Scott, Kan., and a sixteen horse-power Westinghouse automatic engine; the latter being used for running the dynamo.

The mill building has a storage capacity for ore of fifty to one hundred tons. From the bins the ore passes to the crushing floor above. A seven inch by ten inch Blake crusher is used for coarse crushing, and a Dodge crusher for finer work. Beneath the Blake crusher is a set of fourteen-inch by twenty-inch Cornish rolls, from which the ore passes by a conveyor to the main elevator, which carries it up thirty-one feet to the top of the mill. By means of slides and chutes the crushed ore may be sent at will to various machines to be tested by different methods. For concentration there are provided revolving sizing screens giving facilities for preparing six sizes, besides hydraulic separators for classifying slimes into three grades. The coarser sizes may be worked upon full sized jigging machines of the Hartz pattern, the finer sizes being jigged upon bottom discharge machines, and the slime worked upon a double Rittinger percussion table, or otherwise as desired. A small apparatus, run by an electric motor, is also provided for dry concentration. Amalgamation tests may be made upon a working scale by different methods including plates and riffles, pans and settlers, etc. A five-stamp gold mill with silvered plates and aprons of the latest and most approved construction, by Fraser & Chalmers, of Chicago, permits the working of free-milling gold ores by the usual methods and on a large scale. Several lots of ore have been successfully worked and returns made in gold bullion, thus familiarizing the mining students with all the details of feeding, stamping, amalgamating, cleaning up, retorting, smelting and assaying. In addition to the five-stamp mill a smaller prospecting mill of three stamps has been added so as to work small lots of ore of from 100 to 500 pounds. A sampling mill permits of rapid crushing and mixing large samples preparatory to assaying.

The assay laboratory is equipped with assay furnaces for crucible work, for scorifying and cupelling, and for retorting mercury from amalgam. An adjoining room, supplied with water, gas and electric current, has a roomy hood for work involving fumes, with

tables and desks for student work, besides all needed appliances for assaying by dry and wet methods including electrolysis. The laboratory also has desks and fittings for the chemical work required in the metallurgical and mineralogical investigation and analysis of ores, mineral fertilizers and qualitative tests of minerals.

PHYSICS.

Three large rooms in the basement of the main building are set apart for the teaching of physics. The facilities for experimental demonstration of all important phenomena are very complete. The lecture room is fitted with shutters, so that it can be darkened. A beam of sunlight, directed by a fine clock heliostat outside, may be thrown steadily across the lecture table for experiments on light, or used in connection with the solar lantern for a variety of other work. The lecture table is supplied with gas, water, electric currents from primary and storage batteries, and from the large dynamo.

Adjacent to the lecture room are the physical laboratory and the apparatus room in which are kept the many instruments owned by the University, among which may be mentioned: an Atwood's machine; Kater's pendulum; whirling table; many balances; barometers; an air pump and accessories; a hand dynamo; motors; six storage cells; a large number of primary batteries; induction coils; Deprez-D'Arsonval tangent, and sine galvanometers; rheostats; Wheatstone's bridges; a fine testing set; a Wimshurst electric machine; Leyden jars; Geissler's and Crooke's tubes; diapasons; a sonometer; lenses, prisms, and mirrors of all kinds; a polariscope; steam gauges; indicators; calorimeters; and a full equipment of simple pieces of apparatus for the use of elementary classes.

MANUAL TRAINING.

The small brick building described on a previous page contains rooms devoted to woodworking and drawing. These rooms are equipped with tools and machinery for classes in carpentry, joinery, wood-turning and cabinet work.

Forge, pattern and machine shops will be erected during the present year. Rooms have been equipped in the small cottage for instruction in domestic science.

REQUIREMENTS FOR ADMISSION, ETC.

Applicants for admission to any department of the University will be required to furnish satisfactory evidence of good moral character, and of honorable dismissal from the schools with which they were last connected.

For admission to the freshman class, applicants must be at least sixteen years of age and must pass satisfactory examinations in subjects sufficient to give twelve credits as described below. One study pursued satisfactorily for one year, one period a day, as ordinarily taught in high schools, entitles a student to one credit. The subjects upon which examinations must be passed and the credits assigned, are:

Mathematics, including arithmetic, algebra, and plane geometry—3 credits.

English—2 credits.

History and Civics—1 credit.

Elementary Science—1 credit.

Latin, German, French, Spanish, Drawing, Manual Training or Advanced Science—5 credits.

The scope of work required in the various subjects is indicated below.

MATHEMATICS—Arithmetic, entire, including the metric system; Algebra, through quadratic equations, including factoring, the greatest common divisor, and the least common multiple, as treated by Wentworth or Wells; Geometry, all of plane. Wentworth or Wells.

ENGLISH—A competent knowledge of the elements of English grammar, composition, the elements of rhetoric, and the following English classics or acceptable equivalents: Longfellow's *Evangeline*; Irving's *Sketch Book*; Scott's *Ivanhoe* and *Lady of the Lake*; Whittier's *Snow-Bound*; Shakespeare's *Julius Cæsar* and *Merchant of Venice*; George Eliot's *Silas Marner*.

HISTORY—Ancient, Mediaeval and Modern. The text book in use in the sub-collegiate department is Adams's *European History*. United States History; Science of Government as contained in Fiske's *Civil Government in the United States*.

ELEMENTARY SCIENCE—Geography, political and physical, as included in "The Natural Advanced Geography;" Physics, as much as is contained in "Gage's Elements of Physics." Note books covering such laboratory work as has been performed by the student should be presented for examination.

LATIN, FRENCH, GERMAN OR SPANISH.

If any language is offered it must be to the extent of two credits, as a single year's study of a language is not considered to have sufficient educational value to be entitled to credit.

The requirements in ancient and modern languages well be equivalent to work described on pages 26,, 27,, 28, 29,

DRAWING AND SHOP WORK.

The general character of this requirement is indicated on page 42 as the student seeking credits in this department must be prepared for Drawing 1 and 2 and Shopwork 1 and 2.

ADVANCED SCIENCE—Two years' creditable work in biological science, or chemistry, or physics, at least one-half of which has been laboratory work, the quality and scope of which must be shown by the original laboratory note books.

Students from other institutions of equivalent rank may be admitted to the higher classes upon the presentation of properly authenticated certificates, showing clearly to the satisfaction of the faculty that they are qualified to proceed with such work.

Arrangements have been made with the Arizona Normal School, at Tempe, whereby students from that institution may have their record transferred to the books of the University with full credit, upon presentation of a certificate duly signed by the principal. Students of this University may also obtain the equivalent privilege at the Normal School by presenting the proper certificate of standing signed by the president.

The faculty desires to establish such relations with high schools and other educational institutions as will enable it to accept their certificates without question. To this end presiding officers are respectfully requested to correspond with the president.

REGISTRATION OF STUDENTS.

All students are required to register on registration day at the beginning of the year in the president's office. A matriculation fee of \$5.00 is required of all students. Each will receive a card indicating the classes which he or she is to attend, and a receipt for the matriculation fee, when paid. No class card will be issued until all dues are paid. No change in registration can be made without proper authority.

RECORDS.

The class standing of each student is determined by the instructor in charge. The method of ascertaining the students' record is left to the instructor, and his report in all cases is final. Reports of standing in classes are regularly sent each month to parents and guardians from the president's office. Those to whom these reports are addressed are urgently requested to examine each with care and to spur up delinquent students or commend those who are diligent, as the case may be. Without such parental co-operation, good results cannot be anticipated.

FACULTY MEETINGS.

Regular meetings of the faculty are held weekly. Students' individual petitions must be in the hands of the president before the hour of faculty meeting in order to receive action the same week. Petition from classes, or from any two or more students, will not be acted upon by the faculty unless presented in writing to the president at least two days before the meeting at which action is desired.

DISCIPLINE.

It is understood that students enter the institution with certain purposes and that they will cheerfully conform to such regulations as may be made by the faculty. It is the aim of the faculty to maintain a high standing of integrity and a strict respect for truth. Any attempt on the part of the student to present as his own the work of another, or to pass any test or examination by unfair means, is considered a most serious offense. Any

conduct harmful to the moral standing of the school will, after due admonition, render a student liable to dismissal.

PRIZES.

Two prizes were awarded on Commencement Day, 1899, follows: A gold medal offered by Mr. Hugo Zeckendorf, of Tucson, for the best essay on an assigned economic subject was awarded to Robert Lee Morton.

A gold medal also offered by Mr. Zeckendorf for the student of the Junior class having the highest average standing was awarded to Charles Pierce Richmond.

A gold medal offered by Mariner's Juvenile Band to the best drilled cadet was awarded to Thomas Trevillian, in May, 1900.

VACATIONS, ACCOMMODATIONS, ETC.

VACATIONS AND HOLIDAYS.

Short vacations (as per Calendar on page 3) are taken Christmas and Easter. The long summer vacation begins about June 1st and continues until near the close of September.

All legal holidays are observed by the cessation of ordinary University work, and the Thanksgiving recess extends from the close of regular exercises on the preceding Wednesday until the Monday morning following.

Appropriate exercises may be arranged by the faculty for all of the legal holidays, in which the students will be expected to join, if required.

Arbor day has been formally adopted by the University Faculty as the regular anniversary, on which shall be celebrated the founding of the institution, in connection with the ceremonies of tree planting.

LIVING ACCOMMODATIONS AND EXPENSES.

Provision is made as far as possible for furnishing board and rooms for students, of both sexes, upon the University grounds.

Young men have excellent quarters in the new dormitory building.

A separate home for young ladies is in charge of an experienced

d capable preceptress who has constant supervision of those coming in "ladies' hall."

There is no charge for tuition in the University. All students are required to pay once only (upon entrance) a matriculation fee of five dollars.

Charges will be made for material actually consumed by students in the laboratories and shops. Such charges will average .00 per term.

Board and room rent will cost from \$15.00 to \$18.00 per month; charges for fuel and lights will be made to cover cost. By resolution of the Board of Regents of the University, board is to be paid in advance at the beginning of each month. Checks, P. O. or Express Money Order should be made payable to the President. No reduction will be made for absence for a period less than one week.

Students will be provided with simple furniture, including single bedstead, table, mirror, wash-bowl, pitcher and slop jar. They will supply their own lamp, mattress, pillow, bed clothing, towels, napkins, etc. They will care for their own rooms under the direction of the person in charge.

Text-books required are obtained direct from the publishers through a book association managed on the co-operative plan under the direction of the Faculty, and may vary in cost to a student between \$5.00 and \$10.00 in different years of the course.

Economical students should readily go through the year with \$50.00 to \$200.00, excluding clothing.

Members of the battallion will be required to provide themselves with the prescribed uniform. The cost of uniform with cap, including transportation charges, will be \$16.25. This uniform has shown better wearing qualities than a civilian suit of equal cost, and parents are urged to consider the matter of uniform when supplying their sons with clothing for the approaching school year. It may be worn on all occasions, and thus will remove the necessity for the usual expenditures for outer clothing other than overcoats.

Provision has been made for the self-support of students to a limited extent.

LITERARY SOCIETIES.

The Philomathean Society, an organization of students open to all, holds its meetings in the assembly room of the University. Its work embraces general literary exercises and parliamentary usage, and is a valuable adjunct to the regular college course.

The Lescha, a secret society of limited membership, open only to students of college grade, conducts regular meetings at the University. Its purpose is to promote the literary taste and attainments of its members by rigid and serious work; special attention being paid to the art of debating, as also to gaining familiarity with parliamentary usages by constant practice.

ATHLETICS.

Encouragement is given to athletics and athletic organizations are under the immediate care of a committee of the faculty. Membership in these organizations is subject to forfeiture for failure in regular line of school work.

MILITARY TRAINING.

Appreciating the importance of military drill as a physical exercise and as an aid to discipline, and in compliance with the provision has been made for a course in military science and tactics.

Military drill is required of all male students throughout the preparatory course and as far as the end of the sophomore year, unless excused by the faculty for sufficient cause, and is obligatory through the remaining years. Students claiming exemption from drill by reason of physical disability will be required to secure from a physician designated by the faculty, a certificate of incapacity, except when the debility is apparent. In general the officers and non-commissioned officers will be chosen from the highest classes, scholarship as well as proficiency in drill being considered in making promotions.

Each member of the military organization will be required to provide himself with the prescribed uniform within six weeks of his entrance. The uniform consists of cap, coat and trouser of cadet gray cloth trimmed with black braid and closely resembling

the undress uniform of the U. S. Military Academy at West Point. White cotton gloves are also required. A committee of the faculty will protect the interests of students by inspecting all uniforms as received from the makers in order to secure good materials and workmanship at a minimum cost.

An equivalent of the time occupied in military drill will be devoted by female students to physical culture, vocal culture, and instruction in the rudiments of hospital practice and prompt relief of the injured:

COURSES OF INSTRUCTION.

The facilities and privileges of the University are open to all qualified persons of either sex without extra charge.

Three regular four-year courses of study leading to a degree are offered, viz:

Literary and Scientific.

Engineering and Mining.

Agriculture.

In each course the work is partly required and partly elective as shown in schedules later. Four hours of recitation a day are required in each course as full work. In laboratory work two to two and one-half hours are considered the equivalent of one recitation hour.

Persons of mature age and with sufficient preparation who are not candidates for a degree will in some cases be admitted to regular classes as special students, without having taken the required work of the lower years of the course; provided, however, that in all such cases they show to the satisfaction of the instructor giving the course that they can take the work with profit to themselves and without detriment to the work of the regular class.

Work is offered in the following lines: English language and literature, Latin, Spanish, French, German, history and civics, mathematics, physics, chemistry, biology, mineralogy and geology, drawing and shop work, engineering, mining.

The scope and nature of the various courses are shown in detail later. The subject of rhetorical is not mentioned elsewhere, but the appearance once during each term in public rhetorical

exercises, suited to their position in the course, is required of all students taking courses leading to a degree and of students taking English or Elocution, unless excused by vote of the faculty.

Classes may not be formed unless a suitable number of persons apply.

Students, who have completed satisfactorily the required work and the specified amount of elective work in either of the four year courses, will be given the degree of Bachelor of Science. (B. S.)

Each candidate for graduation is required to present an acceptable thesis embodying the results of a special study of some subject within the range of the course pursued. The subject of the thesis must be submitted for the approval of the faculty not later than the opening of the second semester of the senior year, and the completed thesis must be presented not later than three weeks before commencement day.

The advanced degrees of Master of Science and Master of Arts are conferred upon Bachelors, graduates from this University or from institutions of equivalent grade, who have successfully pursued a course of study marked out by the faculty and requiring not less than one year.

Logic

2 Credits in Latin
4 Credits in Greek
2 Credits in History
1 Credit in Jurisprudence
UNIVERSITY OF ARIZONA.

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COURSES OF STUDY 1900-1901.

LITERARY AND SCIENTIFIC.—ENGINEERING AND MINING.

FRESHMAN YEAR.

Required—

English 1, 2. ✓

Elective—

Mathematics 1, 2. ✓

Latin 1, 2. ✓

French 1, 2. ✓

German 1, 2.

History 1, 2. —

Spanish 1, 2.

Drawing 1, 2.

Required—

English 1, 2.

Mathematics 1, 2.

Shopwork 1, 2.

Elective—

Latin 1, 2

French 1, 2.

German 1, 2.

Spanish 1, 2.

History 1, 2.

SOPHOMORE YEAR.

Required—

English 3, 4. ✓

Elective—

Mathematics 3, 4.

Latin 3, 4. ✓

French 3, 4. ✓

German 3, 4.

Spanish 3, 4.

Chemistry 1 } Chemistry 2
 } or Botany 1.

History 3, 4.

Required—

Mathematics 3, 4.

Surveying 1, 2.

Elective—

Chemistry 1, 2.

Latin 3, 4.

French 3, 4.

German 3, 4.

Spanish 3, 4.

Drawing 3, 4.

History 3, 4.

JUNIOR YEAR.

Elective—

English 5, 6.

Mathematics 5, 6.

Political Economy 1, 2. ✓

Anatomy and Physiology 1.

Zoology 1.

Mineralogy 1, 2.

Required—

Mathematics 5, 6.

Elective—

Mineralogy, Assaying 1, 2.

Chemistry 3, 4.

Political Economy 1, 2.

Drawing 5, 6.

SENIOR YEAR.

Elective—

Psychology 1, History of Education and Pedagogy 1.

Geology 1, Astronomy 1.

Logic 1, Ethics 1.

And other electives not previously taken.

Required—

Physics and Mechanics 1, 2.

Geology 1, Astronomy 1.

Elective—

Metallurgical Chemistry 1, 2.

Steam, Hydraulic and Electrical

Machinery 1, 2.

And other electives not previously taken.

TABULAR VIEW.

The following list comprises both required and elective subjects arranged by semesters (half years) and periods of recitation. Unless otherwise stated five recitations per week are required in each subject. The Arabic numerals refer to courses as outlined elsewhere. Subjects to which a * is prefixed were taught in 1899-1900 and will be taught each alternate year thereafter. Those to which a † is prefixed will be taught in 1900-01 and each alternate year thereafter. Those not thus designated are taught each year. Students are required to make such choice as will avoid conflict.

PERIOD I.

First Half Year.

English 1.
*French 3.
†German 3.
Mathematics 5.
*Psychology 1.
Spanish 3.

Second Half Year

English 2.
*French 4.
†German 4.
*History of Education 1.
Mathematics 6.
Spanish 4.

PERIOD II.

First Half Year

Drawing 1 M. W. F.
Elocution 1 Tu. Th.
English 3.
†Economics 1.
History 3.
Steam, Hydraulic and Electrical Machinery.

Second Half Year

Drawing 2 M. W. F.
Elocution 2 Tu. Th.
English 4.
†Economics 2.
History 4.
Steam, Hydraulic and Electrical Machinery.

PERIOD III.

First Half Year

Drawing 3.
Drawing 5.
Elocution 3 Th.
English 5.
*Logic 1.
History 1.
Mathematics 1.

Second Half Year

Drawing 4.
Drawing 6.
Elocution 4 Th.
English 6.
*Ethics 1.
History 2.
Mathematics 2.

PERIOD IV.

First Half Year

Astronomy 1.
Drawing 3.
Drawing 5.
†French 1.
*German 1.
Mathematics 3.
Spanish 1.

Second Half Year

Drawing 4.
Drawing 6.
†French 2.
Geology 1.
*German 2.
Mathematics 4.
Spanish 2.

PERIOD V.

First Half Year

Anatomy and Physiology 1.
 Chemistry 1 Tu. Th.
 Chemistry 3 M. W. F.
 Latin 1.
 Latin 3.
 Metallurgical Chemistry 1
 M. W. F.
 Mineralogy & Assaying 1 Tu. Th.
 Physics and Mechanics 1.
 †Surveying 1 M. W. F.

Second Half Year

Botany 1.
 Chemistry 2 Tu. Th.
 Chemistry 4 M. W. F.
 Latin 2.
 Latin 4.
 Metallurgical Chemistry 2
 M. W. F.
 Mineralogy and Assaying 2
 Tu. Th.
 Physics and Mechanics 2.
 †Surveying 2 M. W. F.
 Zoology 1.

PERIODS VI AND VII-

First Half Year

Anatomy and Physiology 1.
 Chemistry 1 Tu. W. Th.
 Chemistry 3 M. F.
 Metallurgical Chemistry 1 M. F.
 Mineralogy and Assaying 1
 Tu. W. Th.
 Physics and Mechanics 1.
 Shop Work 1.
 †Surveying 1 M. F.

Second Half Year

Botany 1.
 Chemistry 2 Tu. W. Th.
 Chemistry 4 M. F.
 Metallurgical Chemistry 2 M. F.
 Mineralogy and Assaying 2
 Tu. W. Th.
 Physics and Mechanics 2.
 Shopwork 2.
 †Surveying 2 M. F.
 Zoology 1.

EXPLANATION OF COURSES OF STUDY.

ENGLISH.—*Prof. Hall and Miss Plimpton.*

The object of the work in English is, first, to promote a taste for literature as a means of pleasure and of culture, and secondly, by means of the study of eminent authors to cultivate a correct standard of literary judgment and taste. With these objects in view the method of work is intensive rather than extensive. A few authors are chosen for careful study, and sufficient time is spent upon these to acquire accurate ideas of their individual merits and style.

In that part of the work devoted to composition the aim is to teach a direct, vigorous style as the outgrowth of clear-cut, accurate thought.

ENGLISH 1, 2, I—LITERATURE; NINETEENTH CENTURY PROSE.—*Freshman Year.* A few of the leading prose writers of the nineteenth century are studied chiefly as a basis for apprecia-

tive, sympathetic criticism. The following authors and works will occupy the greater part of the time: Macaulay, select essays; Carlyle, *Heroes and Hero-Worship*; DeQuincey, *Confessions*. Minto's *Manual of English Prose* is used as a guide.

ENGLISH 3, 4, II—RHETORIC AND COMPOSITION. *Sophomore Year*—Genung's *Practical Rhetoric and Rhetorical Analysis* and Baker's *Specimens of Argumentation* (modern) are used as text-books. One third of the time is devoted to composition, chiefly expository and argumentative, briefs and finished papers being required once a week of each student at that stage of the work.

ENGLISH 5, 6, III—LITERATURE.—*Junior Year*.—Shakspeare, at least five plays; Milton, minor poems and *Paradise Lost*; Wordsworth, Keats, Shelley and Tennyson are studied as extensively as time will allow.

LATIN.—*Miss Foucar*.

The aim of the work in Latin will be to produce in the student the ability to read the original with an appreciation of its meaning and beauty without conscious translation into the vernacular. Incidentally and of no less value, it is expected that his power of observation, mental ability, and knowledge of the use of English will be greatly strengthened. The instruction throughout the course will be shaped with the above ends in view. The laboratory method will be used in part, giving to each pupil the opportunity of doing as much work as his strength and knowledge of the subject will allow.

SUB-COLLEGIATE.

LATIN A—FIRST YEAR—Special attention will be given to vocabularies; an accurate knowledge of all inflectional forms will be insisted upon, and the student will be led to investigate and discover the underlying laws and principles on which these are based. Attention will be paid to the Latin sentence structure, and in translation from Latin into English, idiomatic English will be insisted upon, while in translation from English into Latin, attention will be called to the English grammatical structure and

its comparison with the Latin. In the latter part of the year easy Latin, like *Viri Romae*, will be read. Text-book: Collar's First Latin Book.

LATIN B—SECOND YEAR—An introduction to the study of Roman literature. Selections from Cæsar, the Lives of Nepos, and similar Latin will be read with much sight reading. The text will be studied critically with translation into idiomatic English. Prose composition will be continued throughout the year with incidental study of history and geography. Text-books: Allen and Greenough's Grammar and texts; Daniell's or Bennett's Prose Composition.

COLLEGIATE.

LATIN 1, 2, V.—THIRD YEAR—Cicero's Orations and Vergil's *Aeneid* will be read. While the same principles will govern the work as in the second year, more attention will be paid to sight reading and to the reading of the original with an appreciation of its meaning in the same way that English is read. In connection with the reading of Cicero a thorough study will be made of the Roman system of government and the customs and occupations of the people. In connection with the *Aeneid* a similar study will be made of Latin poetry and the scansion of the hexameter, also of the religious rites and beliefs of the ancients together with the principal mythological characters. Throughout the course attention will be paid to word study and English derivatives of Latin words.

LATIN 3, 4, V.—FOURTH YEAR—The work will consist of selections from Livy, Book XXI, Cicero *De Senectute* and *De Amicitia*, Horace, Odes and Satires, with sight reading. The student will be taught to appreciate the selections read as literature. Careful attention will be given to syntax and idiom, but the aim will be facility in reading. The contemporary literature will also be studied.

FRENCH AND GERMAN.—Miss Foucar.

The work in the modern languages will in general have the same end in view as that in Latin, and will be made an exact equivalent for the work in Latin as far as possible.

FRENCH 1, 2, GERMAN 1, 2, IV—FIRST YEAR—Careful attention will be given to fixing correct habits of pronunciation together with thorough drill in forms and syntax. Constant attention will be paid to translation at sight and at hearing, and to some extent to conversation. Text-books: French; Whitney's French Grammar, Super's French Reader, Heath's Texts. German; Colar's Shorter Eysenbach, Joynes-Meissner's German Grammar, Harris's German Composition, Heath's texts.

SECOND YEAR—French 3, 4, I—Standard prose will be read, selections being taken from Dumas, Hugo and Moliere, together with sight translations and composition. As far as possible French will be made the language of the class room. German 3, 4, I—The same general plan will be followed. Standard prose and a play of Schiller will be read, German being the language of the class room.

HISTORY, CIVICS AND PHILOSOPHY.—*Prof. Adams.*

HISTORY 1, 2, III—*Freshman Year*—History of England. Green's Short History will be made the basis of the work, but the laboratory method will be followed. Especial stress is laid upon the development of institutions and constitution, the relation of cause and effect and the unity of history. Original sources will be consulted as far as possible. A thesis is required.

HISTORY 3, 4, II—*Sophomore Year*—American history throughout the year. After a brief survey of the colonial period a detailed study is made of the formation of the Union and the political and constitutional history of the United States. Letters and speeches of American statesmen, public documents and special histories will constitute the basis of the work. A thesis is required. Open to those who have taken History 1 and 2.

ECONOMICS 1, 2, II—*Junior Year*—Political Economy and Civics. The historical method is used and the *subject* rather than any one writer's presentation of it is treated. The instruction includes recitations, prescribed collateral reading, class room discussion of practical cases and the subjects of banking, finance and taxation is fully treated. Thesis and review exercises are required. Text-book: Walker's Advanced Political Economy.

PSYCHOLOGY I, I—*First Semester*—Lectures, recitations, and collateral reading, with special consideration of the subject as applied to teaching. Text-book: James's Briefer Course.

HISTORY OF EDUCATION—PEDAGOGY I, I—*Second Semester*—This course will give an account of educational evolution both as a culture fact in the history of civilization and as a foundation for professional work. The lectures will give a brief but comprehensive outline of the school system of ancient, mediaeval and modern countries, with a special study of leading educators, such as Socrates, Comenius, Pestalozzi, Froebel, Mann, etc. The course will also cover the present trend of pedagogical thought and practice and will include methods of teaching, school management and school law. Upon the completion of this course graduates of the University will receive the Territorial Teachers' Certificate.

LOGIC—*First Semester*—Jevon's is used as a text-book with collateral reading from Mill, Hamilton, Thomson and others.

PROF. WOODWARD.

SPANISH.—*Mrs. Aguirre.*

A thorough course of instruction in Spanish grammar and in reading, writing, and speaking the language.

SPANISH I, 2, IV—*Freshman Year*—De Tornos's Combined Spanish method is used as the basis of the work. Much attention is given to writing and speaking Spanish. During the latter part of the year selections from Cartillas Históricas are read.

SPANISH 3, 4, I—*Sophomore Year*—The aim of this course will be to teach the student to read and speak the Spanish language with a fair degree of fluency. Much practice in composition and letter writing will be given and various selections from different authors read in class. Spanish will be the language of the class room.

MATHEMATICS.—*Prof. Woodward.*

It is the aim of the work in mathematics to train the student to the habit of logical and vigorous courses of reasoning, to show the wonderful breadth of application of higher mathematics, to

display the beauties and pleasures of the demonstrations, method and results of higher geometry and calculus, and to give such practice in the use of these agents as will enable students who pursue the higher branches of engineering to use them naturally and easily in those multitudinous applications where they are indispensable. The courses in mathematics depend upon each other to such an extent that they can be taken only in the order in which they are printed.

MATHEMATICS 1, 2, III—SOLID GEOMETRY—One-third freshman year. Text-book: Phillips and Fisher's Elements of Geometry.

HIGHER ALGEBRA—Two-thirds freshman year. Text-book: Wentworth's College Algebra.

MATHEMATICS 3, 4, IV—TRIGONOMETRY—One-third sophomore year. Text-book: Wells's Essentials of Trigonometry.

ANALYTIC GEOMETRY—Two-thirds sophomore year. Text-book: Nichol's Analytic Geometry.

MATHEMATICS 5, 6, I—CALCULUS—*Junior Year*—Lectures and recitations covering differential and integral calculus, with special reference to their use in the various branches of higher mathematics which are led up to and investigated by means of the calculus. Text-book: Hall's Differential and Integral Calculus.

SURVEYING 1, 2, V, VI, VII—*Sophomore Year*—Recitations and field work using the level, compass, and transit, covering the elements of land, topographical, railroad and mine surveying. Text-book: Raymond's Plane Surveying.

CHEMISTRY.—*Prof. Guild.*

The instruction in chemistry has two main objects in view: first, to promote general culture; and second, to introduce students to technical work, especially in mining. The first year work in general chemistry and qualitative analysis places the student in an advantageous position to take up the study of mining and metallurgy.

CHEMISTRY 1, 2, V, VI, VII—GENERAL CHEMISTRY—*First Semester—Sophomore Year*—The subject is introduced by

course of lectures and experiments by the instructor, and this is supplemented by recitations and laboratory practice. Emphasis is laid on the laboratory work, and special effort is made to secure its full value both as a source of information and as a means of training students in habits of careful observation and skillful manipulation. Text-book: Remsen's Briefer Course.

QUALITATIVE ANALYSIS—*Second Semester—Sophomore Year*—This subject is pursued with careful attention both to the principles of the science and its technical execution. At the end of the course a fairly bright student is expected to be able to determine the composition of any unknown substance submitted to him for examination. Text-book: Eliot and Storer's Qualitative Analysis, and various reference books.

CHEMISTRY 3, 4, V, VI, VII—QUANTITATIVE ANALYSIS—*Junior Year*—This course has technical value in connection with the mining and metallurgical courses besides training the student in habits of thorough and accurate work.

PHYSICS AND MECHANICS.—*Prof. Woodward.*

PHYSICS AND MECHANICS I, 2—*Senior Year*—Lectures, recitations, laboratory work, and drawing. A knowledge of calculus is necessary hence this course must be preceded or accompanied by mathematics 5, 6.

It is the object of this course to familiarize the student with the fundamental principles that underlie the various applications of engineering science.

(a) Monday, Wednesday and Friday, mechanics of solids; statics, and dynamics; graphic statics as applied to simple roof and bridge trusses with dead, moving, snow, and wind loads; kinematics of machinery.

Text-books: Hall & Bergen's Physics, Dana's Elementary Mechanics, Haskin's Graphic Statics, Jones's Machine Design.

(b.) Tuesday and Thursday. Strength of materials; hydraulics; study of the steam engine. Text-books: Merriman's Mechanics of Materials, Merriman's Hydraulics, Kinealy's Steam Engine and Boilers; Trautwine's Civil Engineer's Pocket Book.

It is expected that (a) will be given only every second year.

hence juniors are allowed to take it during years in which it is given.

BIOLOGY.—*Prof. Toumey and Dr. Tyler.*

In addition to the elementary work provided in the sub-collegiate course, as elsewhere stated, this department offers three lines of work, viz: botany, zoology, anatomy and physiology.

BOTANY I, VI, VII—The preparation for the work in botany consists of the course in elementary biology given in the sub-collegiate department, or its equivalent. The work is of elementary character, covering in a general way the histology, physiology, morphology, and systematic relationships of the more important types of plant life. The instruction is in the form of laboratory work with occasional lectures covering the subjects under investigation. Bessey's Botany, advanced course, is used as text-book, supplemented by the following as necessary reference books: Gray's Structural Botany, Sach's Physiology of Plants, Goebel's Outlines of Classification and Special Morphology. The botanical library contains the more important literature bearing upon the systematic botany of this region.

ZOOLOGY I, VI, VII—In the course in zoology attention is given to the principles of classification; the structure and development and the comparative anatomy of types of animal life. Considerable time is occupied in laboratory work, making dissections and in microscopical study of animal histology. Orton Comparative Zoology is the text-book in use.

ANATOMY AND PHYSIOLOGY, I, VI, VII—One full course is given in human anatomy and physiology. That this subject may be represented in a creditable manner the laboratory is provided with articulate and disarticulate human skeletons, casts representing the vital organs and numerous charts. Martin's Human Body, advanced course, is used as a text book, the daily recitations being supplemented by lectures and laboratory investigations.

In addition to the courses as given above, this department offers facilities for more advanced work or original research in botany to those qualified to pursue the same.

MINERALOGY AND ASSAYING.—*Prof. Guild.*

MINERALOGY AND ASSAYING I, 2, V, VI, VII—*Senior Year*—year's course of lectures, recitations and laboratory work covering (a) crystallography, (b) blow-pipe analysis and determinative mineralogy, and (c) fire assaying. At the end of the course the student is expected to know at sight all the common ores and minerals, and to be able to determine and classify, by the use of the blow-pipe and a few simple reagents, any less common mineral he may meet. A study is also made of the occurrence, uses, and distinctive characters of the most important minerals.

METALLURGICAL CHEMISTRY I, 2, V, VI, VII—*Senior Year*. This work is intended to fit the student accurately to make determinations of gold, silver and lead in bullion. ores, and furnace products, by the furnace method, and to become familiar with the standard methods used in this country for the determination of all the metals of economic metallurgical importance. The course also includes instruction in the complete analysis of alloys, ores, slags, mattes, etc. The text-books required are Fresenius's Quantitative Analysis or some similar standard work, and Furman's Manual of Practical Assaying.

GEOLOGY AND MINING.—*Prof. Blake.*

GEOLOGY I, 2, IV—*Senior Year*.—Lectures and recitations, with laboratory and field-work when possible, supplemented and illustrated by the large collections of rocks, ores and minerals in the Museum.

The course covers the subjects of Physiographic Geology, Structural Geology, Dynamical Geology and Historical Geology.

Economic Geology.—Special attention is given to the economic application of the science; to the structure and origin of mineral deposits and the distribution of mineral wealth.

Mining.—In connection with or following the course in geology attention is given to the art of mining, and to the treatment of ores by smelting, leaching or milling.

Mining Machinery.—A course of lectures to advanced students in the mining course covers the subjects of drilling, hoisting, transporting, pumping, ventilation, crushing ores, concentrating and shipping ores.

DRAWING AND SHOPWORK.—*Prof. Holmes.*

A THREE YEARS' COURSE IS PROVIDED IN DRAWING.

DRAWING 1, 2, II—Plain lettering, free hand sketching, use of instruments, orthographic projection, working drawings of construction in carpentry and joinery, tracing and blue printing.

DRAWING 3, 4, III, IV—Ornamental lettering and design of titles, intersection of solids and development of surfaces, shade and shadows, map drawing, the technic of mechanical draughting. Open to all who have taken Drawing 1, 2.

DRAWING 5, 6, III, IV—Machine design. Open to all who have taken Drawing 3, 4.

SHOP-WORK 1, 2, VI, VII.—The purpose of the shop-work is to furnish the student a knowledge of the principles involved in wood and metal manufactures. It is the aim to make the shop particularly useful to the mining course. The student learns by experiment the necessity of all the details of the modern shop. All work is executed from drawings and as far as possible the conduct of the shop conforms to the most approved shop practice of the day. Two courses in shop work are provided, bench work in wood, and forge work.

AGRICULTURAL COURSE.

FRESHMAN YEAR—English, Solid Geometry, Trigonometry, Higher Algebra, Modern Language, Shopwork and Drawing.

SOPHOMORE.—Higher Algebra, Analytic Geometry, Meteorology, Chemistry, Surveying, Botany, Drawing, Farm Equipment, Soils and Irrigation.

JUNIOR YEAR.—Farm Crops, Breeds of Live Stock, Botany, Anatomy, Zoology, Entomology, Floriculture, Landscape Gardening, Forestry, Horticulture.

SENIOR YEAR—Stock Breeding and Feeding, Dairying, Veterinary Medicine, Geology, Fruits and Fruit Culture, Vegetable and Vegetable Culture.

SHORT COURSE OF INSTRUCTION IN ASSAYING.

In order to meet the needs of many young men who are desirous of learning the art of assaying the common ores and

metals, and who are not able to give the time required in the full course of study for graduation and the degree of mining engineer, the Board of Regents has approved a short course of instruction in practical assaying, metallurgy, etc., to be given in the laboratories and mill.

This course commences with the first college term in each year and requires at least two years of time, but students are advised to take the full regular course in engineering and mining, if possible, since in two years they cannot expect more than to make a beginning in these subjects.

REQUIREMENTS FOR ADMISSION.

Young men desiring to take this course are required to be at least eighteen years of age, to have good health, and to have a sufficient knowledge of English, arithmetic and elementary science. They must agree to observe the rules and regulations of the University.

Instruction is gratuitous, but each student is required to pay the regular entrance or matriculation fee of five dollars, and to pay the cost of materials, glassware, and apparatus used by him. For this purpose a deposit of ten dollars will be required each term in advance, and any balance will be refunded.

If for good reasons students are unable to enter at the commencement of the year, they may be received at a later date, upon passing a satisfactory examination upon the studies already passed over by the other students in the course.

Experience with special students in assaying during their stay in the University, and observation of their careers after leaving the institution have shown the following course of study to accomplish fair results with bright students.

Although the right is reserved to require this course of study of those special students who are in full attendance, it may be varied according to the aptitudes or necessities of those concerned.

TWO YEARS COURSE IN ASSAYING.

FIRST YEAR.

General chemistry ($1\frac{1}{2}$ terms); Qualitative analysis ($1\frac{1}{2}$ terms).

Mathematics (3 terms).

English or Spanish (3 terms).

Practical free-hand drawing and shop-work (3 terms) or
Physics (3 terms).

SECOND YEAR.

Mineralogy and blow-pipe analysis (2 terms); Fire assaying
(1 term).

Quantitative analysis (1 term); wet assaying (2 terms).

Mathematics (3 terms).

Geology (2 terms); Economic geology (1 term).

TEXT-BOOKS.

The following text books and others are used;

Chemistry—Remsen, Eliot & Storer, Fresenius and others.

Assaying—Ricketts, Brown; Furman, Aaron.

Mineralogy—Dana, Brush's Determinative Mineralogy,
Dana's How to Study Minerals.

Geology—Dana, LeConte, Geikie.

SUB-COLLEGIATE DEPARTMENT.

INSTRUCTORS

MILLARD MAYHEW PARKER, A. M., *President.*

HOWARD JUDSON HALL, A. B., *English.*

SHERMAN MELVILLE WOODWARD, A. M., *Algebra and Elementary Science.*

FRANK YALE ADAMS, A. M., *History and Civics.*

DAVID HULL HOLMES, *Shopwork and Drawing.*

MRS. MARY BERNARD AGUIRRE, *History and Spanish.*

MRS. EMMA MONK GUILD, *English and Mathematics.*

ANSEL AUGUSTUS TYLER, Ph. D., *Physics and Elementary Science.*

MARY ELIZABETH PLIMPTON, A. M., *English.*

OPAL LeBARRON MCGAUGHEY, B. E., *English Reading and Physical Culture.*

LOUISE H. FOUCAR, B. Lit., *Latin, French and English.*

JOHN FREDERICK DABBS, Ph. B., *Algebra and Bookkeeping.*

KATHERINE K. BARKER, *Domestic Science.*

NORA TOWNER, *Stenography and Typewriting.*

GENERAL INFORMATION.

In this department the University carries on the work of a model High School, with the added advantages of the shopwork.

and drawing of the manual training department.

Students of sufficient age who have finished the study possible to them in their home schools are enabled to continue their preparation for college, at the University, under most favorable circumstances.

The splendid equipment of the scientific laboratories is available for use in this sub-collegiate work, wherever it can be used advantageously, thus rendering strong work in elementary science possible.

The instructors in this department are assisted by the professors of the college department, several of whom regularly conduct sub-collegiate classes.

By reference to the course of study, which follows, it will be seen that it offers a comprehensive curriculum for those who may not be able to pursue their studies beyond this, while it gives a good preparation for college.

To each student who completes the studies of this course, a certificate stating that fact will be given, which certificate will entitle the holder to admittance to the higher courses of the University without examination.

COURSE OF STUDY.

NUMERALS INDICATE NUMBER OF RECITATIONS PER WEEK.

First Year Arithmetic reviewed 5. English 5. American History 5. English Reading 5.	Second Year Higher Arith. and Algebra 5. English 5. Elementary Science 5. Drawing and Shopwork } or Domestic Science } 7 English Reading 3.
Third Year Algebra 5. English 2. History 3. Electives Latin German French Spanish Elementary Science Bookkeeping Drawing and Shopwork } Domestic Science } 7 English Reading 3.	Fourth Year Geometry 5. English 3. Civics 2. Electives Latin German French Physics Stenography and Typewriting Shopwork and Drawing } Domestic Science } 8 English Reading 2.

In the third and fourth years students must choose two subjects from the electives. If a language is elected it must be pursued for two years.

MATHEMATICS.

The course in arithmetic will begin with percentage and will include a thorough review of the remainder of the subject. The instructors will insist on thoroughness and accuracy and a comprehension of the unity of the subject.

Algebra is begun in the latter half of the second year and is continued throughout the third year. Especial attention is given to the transition from arithmetic to algebra, to the fundamental operations and especially to factoring. The course will include as much as is found in any good text-book of algebra through quadratic equations.

Plane Geometry continues through the fourth year. This will be so taught as to develop orderly habits of thinking and of investigation. To that end much original work will be required including practical problems involving the application of the principles learned.

ENGLISH.

The course in English embraces the science of English grammar, composition and rhetoric, besides a critical study of assigned classics. It will begin with a systematic study of grammar. The subject will be treated as a science and the pupil led to investigate for himself the laws and underlying principles of our language. The principles of analysis and parsing, the uses of the cases, of the voices, moods and tenses, and of the auxilliary verbs will be carefully taught. Throughout the whole course attention will be paid to work in composition, the aim being to enable the student to express himself clearly, accurately and with ease. In rhetoric, besides the usual subdivisions much attention will be paid to the principles of style and expression. A thorough knowledge of the following classics or acceptable equivalents will be required: Longfellow's *Evangeline*; Irving's *Sketch Book*; Scott's *Ivanhoe* and *Lady of the Lake*; Whittier's *Snow-Bound*;

Shakespeare's Julius Cæsar and Merchant of Venice; George Eliot's Silas Marner.

Under the general head of English reading the students will be given drill in the elementary principles of reading and of elocution.

HISTORY.

The aim of all of the work in history will be to lead the pupil to see the development of races and nations along political, social and religious lines, and to arouse in him a love for the subject and a habit of broad and discriminate reading.

American history will be reviewed during the first year. Montgomery will be used as a text book but much collateral reading will be required and the institutional side of the history will be made prominent.

The work of the third year will include ancient, mediaeval and modern history. The aim will be to give the student an idea of the essential unity of history and the leading facts in the political development of races and nations. Adams's European history will be used supplemented by the reading of all references contained therein as far as possible.

Fiske's Civil Government in the U. S. is used as the text book in civics. The historical development of the subject is made prominent while practical problems such as taxation, municipal government, are made the subject of special investigation and study.

LATIN, FRENCH, GERMAN AND SPANISH.

For an outline of the course in languages see pages 26, 27, 29.

DRAWING AND SHOPWORK.

The drawing course is designed to be helpful in the study of the arts and sciences wherever graphic representation of the subject is possible. Historic ornament is studied in connection with the history courses. Sketches of apparatus are made in connection with the courses in physics and chemistry. Accurate instrumental drawings are made of the exercises in geometry and shopwork. The application of useful drawing is thus apparent at every stage of the student's development. At the end of each year's

course every student is required to design and make some useful article involving the application of the principles learned and the use of the tools with which he has become familiar.

The shop work will consist of bench work in wood and forge work.

The course in bench work in wood consists of exercises with the different wood working bench tools, so arranged as to embrace the manipulations of the tools in their various applications will also include the most rapid and economical methods of preparing the wood for the machine. Turning of all kinds will form a part of the course.

In the forge work students will be carried through a series of graded exercises in both iron and steel.

DOMESTIC SCIENCE,

The course in domestic science covers the preparation which the proper care of the house requires. It includes home hygiene, household science, chemistry of cooking, the study of foods and practice in all kinds of cooking, plain and fancy sewing, nursing care of the house, management of servants, social duties and customs of society.

BOOKKEEPING, STENOGRAPHY AND TYPEWRITING.

Bookkeeping is taught by the modern budget system. The work is individual and each student may progress as fast as his time and ability will permit. The course is thorough in all the details of office practice. The course includes instruction in commercial law. A complete course in stenography is offered, the Pitman system being used. The school is equipped with Remington typewriters.

PARLIAMENTARY PRACTICE AND DEBATE.

The higher classes in the sub-collegiate department devote one period of each week to work in parliamentary practice and debate. The classes are organized under a regular constitution and by-laws. Instruction is given in parliamentary law using Robert's Rules of Order as a text-book. The members are required to introduce resolutions and prepare debates upon the same, also to appear at stated times with recitations and declamation.

They are also given practice in performing the duties of secretary and in presiding in the meetings.

SCIENCE.

It is the object of the course in science to initiate the student to the processes and methods used in laboratory work, to teach close observation, careful manipulation, and logical deduction, to acquaint the student with the fundamental facts of the various branches of science and to give full practice in the use of good English in describing various observations and experiments.

An introductory laboratory course is given in the second year. The third year is given half to botany and half to chemistry pursued on the laboratory plan. During the fourth year a rigid course is given in physics covering fully college preparatory physics with ample experimental work. Abundant apparatus and laboratory facilities are supplied for all these courses.

AGRICULTURAL EXPERIMENT STATION.

STATION STAFF.

THE PRESIDENT OF THE UNIVERSITY.

H. FORBES, M. S.	Director
W. TOUMNEY, M. S.	Potanist
J. McCLATCHIE, A. M., Phoenix, Ariz., Agriculturist and Horticulturist	
H. TRUE, B. S., Phoenix, Ariz.	Animal Husbandry
A. TYLER, Ph. D.	Associate Botanist
W. SKINNER, M. S.	Assistant Chemist
GUS McBRIDE.	Clerk

ITS ORGANIZATION AND WORK.

The Agricultural Experiment Station has been actively maintained as a department of the University, in accordance with Territorial enactment, since July 1, 1889, the Hatch Act creating it having been passed by Congress in 1887. The funds annually available from the National Government for the maintenance of the Station amount to \$15,000.

The object of the Station, according to the Hatch Act, is, "to be engaged in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture and to promote scientific investigation and experiment respecting the principles and applications of agricultural science."

In accordance with the motives of the Hatch Act, as expressed above, the work of the Experiment Station at the present time may be divided into two parts:

(1) The scientific investigation of subjects relating to agriculture.

(2) The dissemination of useful information relating to agriculture.

In a territory possessing such diversity of climate, soil and water facilities as Arizona, the subjects for investigation must be many, but the Station pursues the policy of concentrating the attention of its staff upon those things of largest or most pressing importance. Some of the features of Experiment Station work at the present time are the introduction of promising drouth resisting forage plants, methods of cultivation with a view to economy in the use of water, management of live stock, including dairying, the culture and propagation of the date palm, the study of the main irrigation water supplies of the territory and experimental work with the sugar beet. Some attention is also paid to the introduction of promising new fruits, to insect pests, to matters concerning irrigation, and to the continuing of soil studies carried on in times past. The results of these investigations have, some of them, been of marked value to the agricultural public, both in Arizona and elsewhere, and the value of scientific investigation of an economic nature is becoming more and more recognized by the thinking public of Arizona.

The results of the investigations undertaken by the Station are published in bulletin form, usually upon the completion of the work. A popular series of articles entitled, "Timely Hints for Farmers," has also been sent out twice each month during the last year, the objects of these publications being to present the results of Station investigations to the farmer in popular form at the time when the information will be most useful. The distribution of these writings is without cost to all who wish and apply for them. A large and growing correspondence on subjects relating to agriculture testifies to the usefulness of the work at present being done by the Station.

In order to still further extend the usefulness of this depart-

ment a series of farmers' institutes is held each year in various localities for the purpose not only of giving information to those who meet with the members of the Station Staff, but, also, for the purpose of becoming acquainted with the different agricultural localities of the territory and learning of the perplexities and problems which confront the farmer.

The offices and scientific laboratories of the Experiment Station are located at Tucson, in the University Main Building; and the advantage, both to the University and to the Station, of conducting this work where the members of the staff have the advantage of association with the faculty of the University and with access to the University Library and equipment is very great.

The Experimental Farm is situated northwest of Phoenix. The date palm orchard is three miles south of Tempe, and the sugar beet investigations during the current year have been conducted under the care of a special workman in the Upper Gila Valley.

At the invitation of the Experiment Station special work has been done by visiting scientists on the entomology and soils of Salt River Valley.

The principle on which all the work of the Experiment Station is conducted is *to do each branch of work at the point where it can be done to best advantage* and the results attained show the wisdom of this mode of procedure.

All communications relating to the Station should be addressed to the *Experiment Station, Tucson, Arizona*.

THE ARIZONA SCHOOL OF MINES.

In addition to the facilities for general instruction in the arts of mining, metallurgy and assaying, this department of the University is provided with a mill for working ores in large or small quantities from a few pounds weight to a ton or more. Mill tests can be made by either the small three-stamp mill or by the large ve stamp battery. There are rolls for roller crushing, and jigs and Rittinger tables for concentrating ores.

SCHEDULE OF RATES FOR ASSAYING AND WORKING ORES.

In accordance with the Legislative enactment approved March 3rd, 1899, the rates for assaying heretofore in force under the law of March, 1897, have been changed. The fifty-cent rate is no longer in force. Former circulars and schedules of rates are revoked and withdrawn. Under the provisions of the new law the Regents of the University of Arizona have established the following rates for assaying ores taken from deposits and mines in the Territory of Arizona.

ASSAYING ORES FROM ARIZONA.

Silver and Gold, or either.....	\$1.00
Silver, Gold and Copper.....	2.00
Copper.....	1.00
Lead.....	1.00
Zinc.....	1.00
Gold, Silver, Copper and Lead.....	2.50
Gold, Silver, Copper and Iron.....	2.50
Gold, Silver, Copper and Zinc.....	2.50

All assays are made in duplicate and in the most careful and thorough manner.

The following rates have been established by the Board of Regents for assaying ores taken from deposits or mines without the Territory of Arizona:

ASSAYING ORES FROM WITHOUT THE LIMITS OF ARIZONA.

Silver and Gold, or either alone.....	\$1.00
Copper.....	1.00
Lead.....	1.00
Zinc.....	2.50
Iron.....	2.00
Silica.....	1.50
Alumina.....	5.00

And for other determinations such rate as the Director of the School of Mines may in each instance fix.

PAYMENT IN ADVANCE REQUIRED.

The Director is required, in all cases, to hold the assay until the fee or charge therefor is paid. Remittances may be made by check or money order; or the money, securely wrapped may be sent with the sample.

RATES FOR SAMPLING AND WORKING ORES.

Lots of 100 pounds or less, including assays of three metals.....	\$ 5.00
Each additional 100 pounds, to 500 pounds.....	1.00
Over 500 pounds, to 1 ton.....	10.00
Each additional ton.....	4.00
Ordinary Stamp Mill test and plate amalgamation, for first ton or fraction of a ton.....	20.00
From 1 to 2 tons.....	30.00
Pan Amalgamation, including crushing and assays, ton....	20.00
Large lots proportionately less; small lots more in proportion.	

CYANIDE PROCESS.

The School of Mines is prepared to make experimental tests of ores and of tailings by the cyanide process, in large or small quantities at rates to be agreed upon with the Director.

Working tests and experiments by other processes may be undertaken at rates to be agreed upon in each instance, depending upon the amount of materials, time and labor required.

CONCENTRATING (INCLUDING ALL ASSAYS).

Wet or dry test of small lot (under 500 pounds).....	\$1 5.00
100 pounds to 1 ton.....	20.00
Each additional ton.....	7.00

QUALITATIVE TESTS.

The determination of the nature of rare and peculiar minerals, not requiring a chemical analysis, or an assay, is made gratuitously. Samples sent for this purpose should be in their original condition, as broken out and not crushed to a powder or pulp. Tests requiring determination of the presence of gold or silver must be paid for at the rate of one cent per ounce. They should

be distinctly labelled inside of the package by the name of the sender, and a letter should be posted at the same time giving the full name and address, and enclosing a stamp for the reply. This offer of free examination is intended to apply to minerals unknown to the sender and does not cover special tests for precious metals or for any metal the presence of which is usually determined by an assay.

HOW TO SEND SAMPLES.

For small samples, under four pounds in weight, the most expeditious and cheapest way is to send by the ordinary mail. If samples or letters containing a postal order are sent by registered mail, a delay of from two to three days is caused, as notice of arrival is given first and then the registered parcel must be sent for. A similar delay results from sending by express. The express company does not deliver parcels at the University. Delays often result from the want of identification. Sometimes the only clue to the name of the sender is the comparison of the handwriting upon the sample and that upon the letter. The postal laws permit the name of the sender to be written and enclosed in the package. Each sample should be labelled by a slip of paper, inside, giving the name and locality of the claim and the address of the sender.

The name of the claim is desired in order that the value and distribution of the mineral wealth of the Territory may be better known.

Special rates of freight on consignments to the "DIRECTOR OF THE SCHOOL OF MINES" are granted by the Southern Pacific R. R. from points in Arizona. Ask the agent at shipping point for particulars.

All business communications, checks and money orders should be addressed to the

ARIZONA SCHOOL OF MINES,

WM. P. BLAKE, DIRECTOR.

TUCSON, Pima Co., Arizona.

SPECIAL NOTICE.

REDUCED RAILROAD RATES TO AND FROM THE UNIVERSITY.

The Southern Pacific, the Maricopa, Phoenix & Salt River Valley Railway Company, the Santa Fe, Prescott & Phoenix Railway, and the G. V. G. & N. Railway from Bowie to Globe, have all generously allowed students in attendance upon the University half rates when journeying to and from their homes. In the case of students coming to the University these half rates may be secured by notifying the president of the University a sufficient length of time in advance to enable him to secure from the proper authorities the permits. Students at the University may secure transportation to their homes and return at any time by making application at the office of the president of the University.

The railroad authorities have very kindly supplied a quantity of blanks to be filled out and presented to the proper ticket agents. It is hoped and expected that like concessions may be secured over all the roads in the territory, as students may desire to travel over various lines in coming to the University.

THE TUCSON STREET RAILWAY.

Street cars make frequent and regular trips to the University grounds from the business center of the city, affording convenient transportation to and from the University.

MILITARY ORGANIZATION, 1899-1900.

COMMANDANT OF CADETS, LIEUT.-COL. FRANK YALE ADAMS.

Captain and Military Instructor.....	Charles Pierce Richmond
1st Lieutenant.....	Rudolph Castaned
2nd ".....	George M. Parke
Ordnance Sergeant.....	Philip Matthew Reill
1st ".....	James Newton Robinso
Sergeant.....	Charles Signor Stou
".....	Lester Albert Steinfel
".....	Elbert John Hollingshea
".....	Duncan Hugh Campbe
Corporal.....	William Thomas Olne
".....	Norman John Rober
".....	Roy G. Mea
".....	George Marti
".....	Allen Chartan Bernar
Chief Musician.....	Henry E. Castaned
Musician Corporal.....	Benito G. Suar
" ".....	Harry Havens Bus

ALUMNI ASSOCIATION.

ORGANIZED JUNE 2ND, 1897.

CONSTITUTION.

In order to promote the interests of the University, to secure unity among its graduates, and to foster an attachment to our Alma Mater, we do hereby constitute ourselves an association to be known as the ALUMNI ASSOCIATION OF THE UNIVERSITY OF ARIZONA.

I.

All persons who have received a degree from the University of Arizona are members of this association.

II.

All members of the faculty are honorary members of the association.

III.

The officers of this Association shall be a president; one vice president from each successive group of five classes, provided that when the last group shall number three classes it shall thereafter be entitled to a vice-president, a secretary and a treasurer.

IV.

There shall be an executive committee to consist of the following persons: The secretary and treasurer of the association, and three others chosen by the association, one of whom shall be designated as chairman of the committee.

V.

It shall be the duty of the executive committee to arrange the programmes for Alumni Day and other public occasions, to regulate the finances of the Association, to perform such other duties as may be imposed upon them, and to attend to all business of the Association not otherwise provided for.

VI.

The president shall be ex-officio a member of all committees. At each annual business meeting he shall appoint a committee of two persons to audit the treasurer's accounts.

VII.

The officers and the executive committee shall be elected by ballot at the annual business meeting to be held on Alumni Day, a majority of all votes cast being necessary for election.

VIII.

Any proposition to alter or amend these articles of Association must be made at a regular meeting, and have the assent of two-thirds of the members present.

GRADUATE STUDENTS.

Begg, William, B. A., Toronto University	Los Angeles, Ca
Cowan, Edith Clement, A. M., Due West College	Tucso
Mann, James Stephen, B. S., John B. Stetson University	DeLand, Fla
Morton, Robert Lee, B. S., University of Arizona	Tucson, Ariz

SENIORS.

Flood, Ida Clarissa	Tucso
McCrea, Samuel Pressly	"
Richmond, Charles Pierce	Phoeni
Welles, Florence Russell	Tucso

JUNIORS.

Castaneda, Rudolph	Benso
Ferrin, Clara	Tucso
Haynes, Felix Grundy	Sacato
Parker, George Millard	Tucso
Stratton, Edith Olive	"

SOPHOMORES.

Blumenkranz, Moses	St. Louis, Mo
Brown, Ruth	Tucso
Brown, Willard Morse	Pasadena, Ca
Edwards, Charles Greenwood	Cincinnati, Ohio
Parker, Grace Miles	Tucso
Reilly, Philip Matthew	New York Cit
Smith, Bessie	Tucso
Watts, Carrie Mabel	Congres

FRESHMEN.

Campbell, Duncan Hugh	Prescot
Culver, Emma Louise	Tucso
Johnson, Emma Amelia	"
Rockwell, Guy Lionel	Compton, Ca
Stout, Charles Signor	Tucso
Strobridge, Earl	Skull Valle
Wakefield, Walter James	Tucso
Weir, Martha McClain	"

THIRD SUB-COLLEGIATE.

Bley, John Payren	Pasadena, Ca
-----------------------------	--------------

Brown, Owen	Tucson
Cheyney, Bernice	Tucson
Drumiler, Elbert Pearl	Congress
Geiger, Alberta	Bucyrus, Ohio
Haley, John Joseph, Jr.	Tucson
Harrison, Eleanor Hargrove	Olney, Ill.
Katzenstein, Alma Fannie	Tucson
Norway, Ora Elinor	Los Angeles
Reynolds, William Graham	San Mateo, Cal.
Roberts, Norman John	Benson
Robinson, James Newton	Safford
Steinfeld, Lester Albert	Tucson
Yeager, Harlow Alonzo	Phoenix

SECOND SUB-COLLEGIATE.

Barkley, Hassie May	Mesa
Bernard, Allan Chouteau	Tucson
Castaneda, Henry Elias	Benson
Davila, Leobaldo	Magdalena, Sonora, Mexico
Day, Courtland Francis	Duncan
Early, Claude Clinton	Phoenix
Fish, Florence	Tucson
Foltdree, Leo K.	"
Greenhaw, Paul	Phoenix
Gadsell, Walter Elias	Buckeye
Gerndon, Thomas Austin	Tucson
Leon, Antonio	"
Lopez, George Peter	"
Marshall, Thomas K.	Mammoth
Martin, George	Tucson
Martin, Willie Barnes	"
Martin, Marguerite Grey	"
Mayer, Martie G.	Mayer
Mayer, Mary B.	"
Moore, Kirke Tonner	Tucson
Murphy, Carobel	"
Neely, William Thomas	Solomonville
Reindorff, Lee Hickerson	Tucson
Truscoe, Benjamin Franklin	Globe
Wendleton, Rose	"
Wiest, Raymond Marshall	Fortuna
Wletti, Albert Ralph	Tucson
Wobbins, Anna Dell	"

Soldini, Constance Rosalie.....	Tucson
Stafford, Edward Satterlie.....	Safford
Tangye, William Henry.....	Butte City, Montana
Thomas, Samuel Pierce.....	Tucson
Trevillian, Thomas.....	Globe
Whittle, Callie.....	Tucson
Whipple, William Dominicus.....	Clifton
Wilbur, Mary Strange.....	Tucson

FIRST SUB-COLLEGIATE.

Arevalo, Miguel Durazo.....	Hermosillo, Mex
Arriaga, Alfredo.....	Santa Cruz, Sonora
Aldridge, Conrad Milton.....	Tucson
Allison, Mamie Jane.....	"
Anderson, Quintus James.....	"
Angus, Thomas Edwin.....	"
Barthelemy, Casimiro.....	"
Bernard, Noah Curry.....	"
Brena, Pedro.....	"
Brown, Alice May.....	"
Bruce, Ella Frances.....	"
Buehman, Willis Harry.....	"
Bush, Harry Haven.....	"
Cabral, Juan.....	La Colorada, Sonora, Mex
Cheyney, Frances.....	Tucson
Clark, William Enoch.....	Solomonville
Elias, Antonio.....	Tucson
Estabrook, Pearl Lucy.....	"
Feldman, Mabel.....	"
Fetterly, Zena Ownby.....	"
Fiske, Fanny May.....	Globe
Fredley, Fred John.....	Yuma
Granger, Herbert Elwood.....	Tucson
Grant, William.....	Phoenix
Hagan, James Alvin.....	Clifton
Hamilton, Loyal Gertrude.....	Tucson
Hildreth, James Albert.....	Safford
Jones, Earnest.....	San Pedro, Cal
Laos, Teofilo.....	Guaymas, Mexico
Lowell, Gertrude Sophia.....	Tucson
Marrin, Katherine Frances.....	"
Mayer, Wilbur Joseph.....	Maye
McDonald, John Archibald.....	Harshaw

Mead, Minnie Jean	Patagonia
Moore, Nino	Tucson
Moore, Roy Webb	"
Myers, Emma	"
Myers, Gertrude A.	"
Olney, Clantie Claborn	Solomonville
Patton, Jose	Tucson
Payne, Alfred Edwin	Clifton
Perry, Mamie Emma	Tucson
Perry, Norman Augustin	"
Riggs, Edward Murry	Willcox
Santa Cruz, Edgardo	Hermosillo, Mexico
Seymour, Frank	Tucson
Slaughter, Joel McKee	Springerville
Slaughter, Paschal Eldridge	"
Stratton, Elmer Willis	Tucson
Suarez, Benito Guadalupe	Solomonville
Tarbox, Evaline Bertie	Tucson
Thornton, Ethel Lucy	"
Valencia, Florentino	Oputo, Sonora, Mexico
Varela, Refugio Federico	Hedges, Cal.

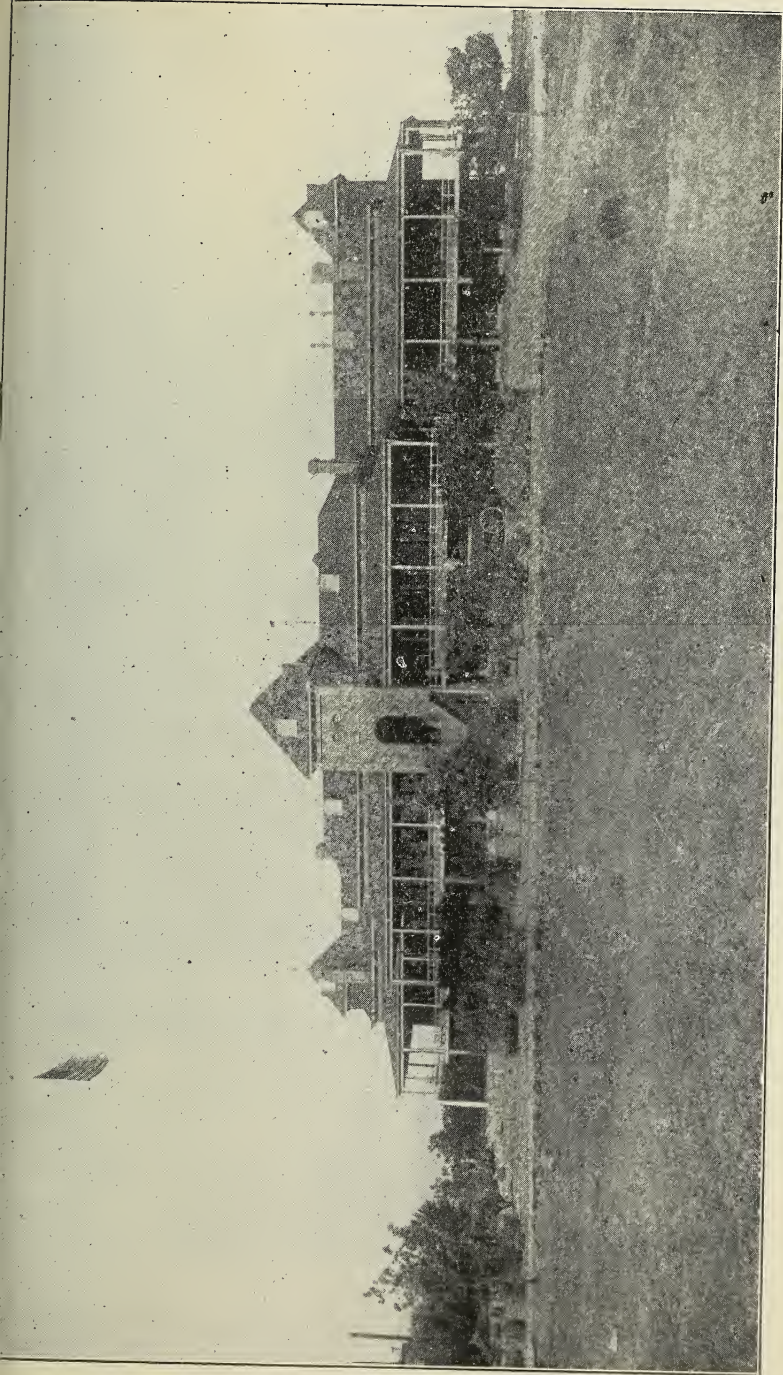
SPECIAL.

Angus, William (Mining)	Tucson
Anspach, Clarence A. B. (Mining & Stenography)	Springerfield, O.
Case, Mrs. Carrie E. (English & Spanish)	Boulder, Col.
Cauthorn, Emily Burno (Spanish)	Tucson
Daily, William Henry (Stenography & Chemistry)	Carthage, Ill.
Dish, Frank Wakefield (Mining)	Tucson
Drench, Charles Wesley	Pasadena, Cal.
Dodwin, James Cooper	Tempe
Dodwin, Lillie Matilda (Book-keeping)	Tucson
Duld, Nott Erwin (Political Economy)	"
Dawley, Fred Graham (Mining)	Los Angeles, Cal.
Dollingshead, Elbert John (Political Economy and Logic)	Phoenix
Dolmes, John Garnett (Mining)	"
Dolmes, William Edward	Austin, Texas
Dughes, John T. (Political Economy)	Tucson
Dopez, Frank Gonzalez (Stenography)	Tucson
Dartin, Stefana, (Book-keeping)	"
McCulloch, Mrs. Katherine (Stenography & Spanish)	Tucson
Head, Roy G. (Mining)	Patagonia
Herry, Ralph Waldo Emerson (Mining)	Belfast, N. Y.

Pittock, Jennie Priscilla (Spanish, Domestic Science).....	Nevilton, Penn.
Reed, Mrs. Rena E. (Spanish, Stenography).....	Tucson
Richardson, Nellie Beryl (Stenography).....	"
Riecker, Edna Florence (Bookkeeping).....	"
Russell, Ross Moody (Mining).....	Phoenix
Stewart, Clyde A. (" & Commercial).....	Tempe
Sullivan, Virginia (Domestic Science).....	Pasadena, Cal.
Towner, Nora (English Literature).....	Tucson

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MAIN UNIVERSITY BUILDING.



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REGISTER

Of the

University of Arizona

TENTH YEAR
1900-1901

ANNOUNCEMENTS
1901-1902

TUCSON, ARIZONA
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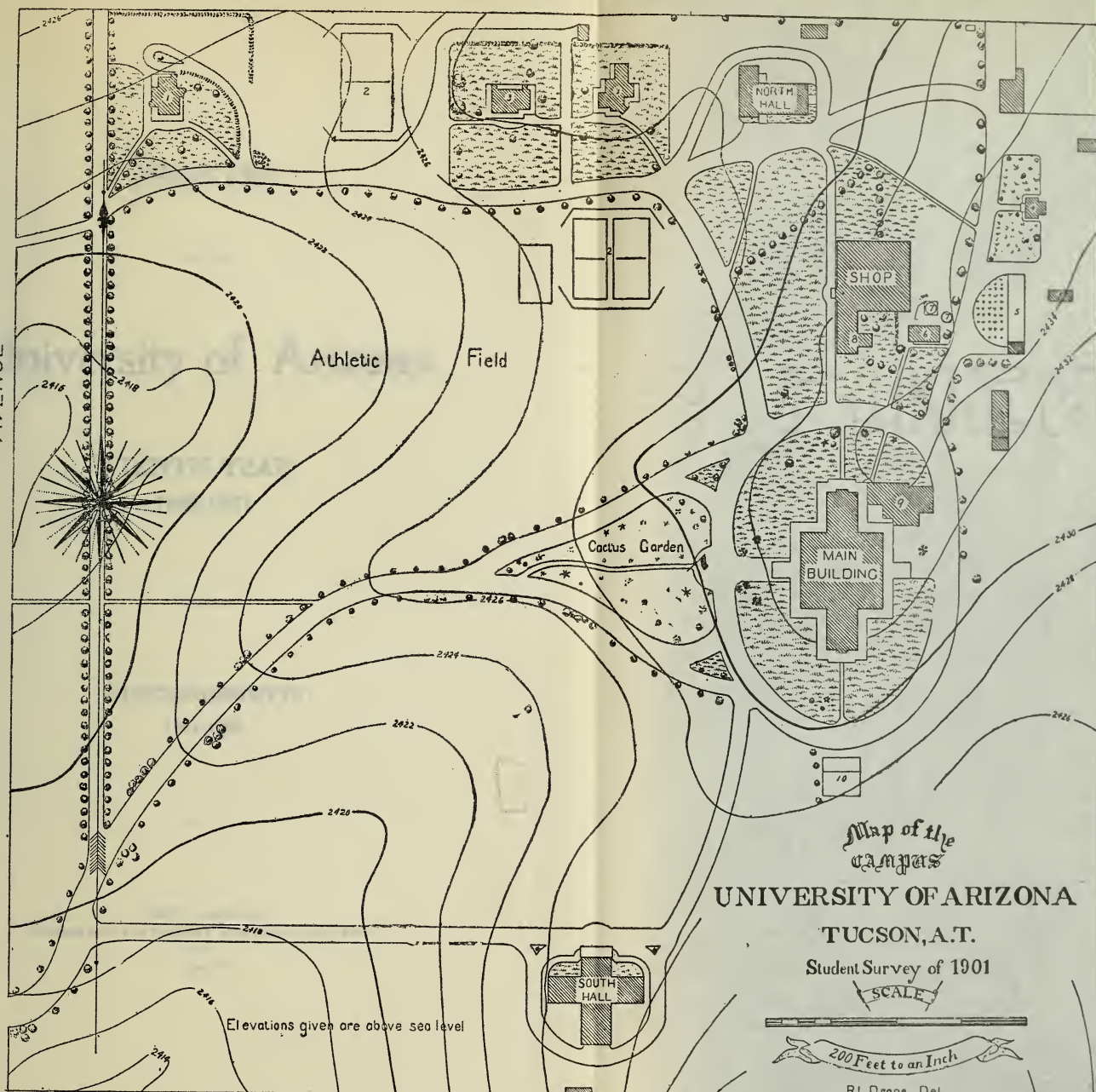
Presidents
House
Tennis Courts
Professors'
Houses
Domestic
Science House
Green House
Boiler House
Water Tanks
Assay Dept.
Mining Mch.
Meteorolog-
ical Station

Arminius
Mason Stg.
HIRD ST.

URTH ST.

AVENUE

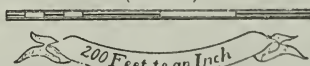
PARK



Map of the
campus
UNIVERSITY OF ARIZONA
TUCSON, A.T.

Student Survey of 1901

SCALE



R.L. Drenth, Del.



REGISTER

OF THE

University of Arizona

TENTH YEAR

1900-1901

ANNOUNCEMENTS

1901-1902

TUCSON, ARIZONA

HEERMANS STATIONERY COMPANY—PRINTERS

1901

92

CALENDAR

1901

Sept. 16, Monday	}	..	..	..	Entrance Examinations.
Sept. 17, Tuesday	}				
Sept. 18, Wednesday		..	..	..	Registration of all students.
Sept. 19, Thursday		..	..	..	First Semester begins.
Nov. 27, Wednesday		..	..	..	Thanksgiving Recess begins.
Dec. 2, Monday		..	..	..	Instruction resumed.
Dec. 20, Friday		..	..	..	Holiday Recess begins.

1902

Jan. 7, Tuesday	..	..	..	..	Instruction resumed.
Feb. 6, Thursday	..	..	..	..	First Semester ends.
Feb. 7, Friday	..	..	..	..	Arbor Day ; celebrated also as the Anniversary of the University.
Feb. 10, Monday	..	..	..	..	Second Semester begins.
June 1, Sunday	..	..	..	..	Baccalaureate Discourse.
June 3, Tuesday	..	..	..	..	Annual Commencement Address.
June 5, Thursday	..	..	..	..	Commencement.

BOARD OF REGENTS

EX-OFFICIO

HON. NATHAN OAKES MURPHY Phoenix
Governor of the Territory.

HON. R. L. LONG Phoenix
Superintendent of Public Instruction.

APPOINTED BY THE GOVERNOR

HON. WILLIAM HERRING Tucson
Chancellor.

HON. JAMES A. ZABRISKIE Tucson
Secretary.

HON. HERBERT B. TENNEY Tucson
Treasurer.

HON. ANTHONY V. GROSSETTA Tucson

FACULTY

MILLARD MAYHEW PARKER, A. M.,
President.

WILLIAM PHIPPS BLAKE, Ph. B., A. M.,
Professor of Geology, Metallurgy and Mining; Director School of Mines

HOWARD JUDSON HALL, A. M.,
Professor of English; Librarian.

ROBERT HUMPHREY FORBES, M. S.,
*Director and Chemist Agricultural Experiment Station;
Professor of Chemistry.*

SHERMAN MELVILLE WOODWARD, M. S., A. M.,
*Professor of Mathematics and Mechanics; Meteorologist Agricultural
Experiment Station.*

FRANK YALE ADAMS, A. M.,
*Lieutenant-Colonel N. G. A., Commandant of Cadets;
Professor of History and Pedagogy.*

FRANK NELSON GUILD, B. S.,
*Professor of Mineralogy and Analytical Chemistry;
Associate Professor General Chemistry.*

ALFRED JAMES McCLATCHIE, A. M.,
Professor of Agriculture and Horticulture.

DAVID HULL HOLMES,
Director of Manual Training.

MARY ELIZABETH PLIMPTON, A. M.,
Preceptress; Associate Professor of English.

GORDON H. TRUE, B. S.,
Professor of Animal Husbandry Agricultural Experiment Station.

DAVID GRIFFITHS, Ph. D.,
Professor of Biology; Botanist Agricultural Experiment Station.

GEORGE EDSON PHILIP SMITH, B. S., C. E.,
Professor of Physics and Engineering.

MRS. MARY BERNARD AGUIRRE,
Instructor in History and Spanish.

MRS. EMMA MONK GUILD,
Instructor in Sub-Collegiate Department.

LOUISE H. FOUCAR, B. A., Lit. B.,
Instructor in Botany, Mathematics and Languages.

WILLIAM W. SKINNER, M. S.,
Assistant Chemist Agricultural Experiment Station.

OPAL LeBARON McGAUHEY, B. E.,
Instructor in Physical Culture and the Art of Expression.

MABEL GRAY HOOVER,
Instructor in Domestic Science.

NORA TOWNER,
President's Secretary; Instructor in Stenography and Typewriting.

HERBERT BROWN,
Curator Territorial Museum.

OTHER OFFICERS

MARK WALKER, JR., B. S.,
Commercial Assayer.
(Absent on leave.)

JAMES STEPHEN MANN, B. S.,
Acting Commercial Assayer.

CHARLES E. CHASE,
Engineer.

WILLIAM SIEWERT,
Steward.

STUDENT ASSISTANTS

RUDOLPH CASTAÑEDA
ELBERT J. HOLLINGSHEAD
LESLIE A. GILLET
HENRY E. CASTAÑEDA
NORMAN J. ROBERTS
J. NEWTON ROBINSON
ROY G. MEAD
MAY KIRKPATRICK

UNIVERSITY OF ARIZONA

ORIGIN

The University was established by an act of the Thirteenth Legislative Assembly of the territory in 1885. The bill was introduced into the council by Hon. C. C. Stephens of Tucson, carried through the house by the able efforts of Hon. Selim M. Franklin and approved by the governor March 12, 1885. The University was opened to students in October, 1891.

DESIGN

The purpose of the University of Arizona is to afford the young men and women of the territory a general education in science and literature; and so far as possible a technical education adapted to the development of the peculiar resources of Arizona. In furtherance of this latter purpose, instruction is especially provided in agriculture, the mechanic arts, and in mining and metallurgy. The Agricultural Experiment Station, a department of the University, is wholly engaged in developing the agricultural resources of the territory. The institution aims to fill in the territory the place occupied in the states by the state universities. That the institution may be of service to all, a sub-collegiate department is maintained.

LOCATION AND CLIMATE

The University of Arizona is located at Tucson, one of the largest towns in the territory.

Tucson is on the main line of the Southern Pacific railway, 312 miles west of El Paso, Texas, and 500 miles east of Los Angeles, Cal. The town lies in a broad, flat valley at an elevation of 2,400 feet above sea level and is surrounded by mountains. Its dry, healthful situation with its mild and equable climate has made Tucson a famous winter resort.

The winter climate is especially good; the temperature is cool and strengthening but not severe, the lowest temperature recorded during the average year being about twenty degrees above zero, Fahrenheit. But little rain falls during the winter; fogs are un-

known; cloudy days are rare, the percentage of sunshine throughout the winter being greater than that recorded at any other place in the United States. Owing to the extreme dryness of the air the highest temperatures known are less oppressive to the senses and less dangerous to the health than the summer heat of the upper Mississippi valley states. The total amount of rainfall averages less than twelve inches.

SITE

The University is situated upon high ground about a mile from the business center of the city with which it is connected by street-car line. On every side it commands a view of mountain scenery of remarkable extent and grandeur. The location cannot be surpassed for healthfulness. The water supply of the University is drawn from a well on the premises 100 feet deep and is of unusually good quality.

BUILDINGS

The main building is 200x105 feet, two stories in height, the first story of gray stone, the second of red brick, and is completely surrounded by a wide two-story veranda. This building contains the offices, recitation rooms, laboratories and apparatus rooms of the various departments, an assembly room, the libraries of the University and Experiment Station and the territorial Museum. Adjoining the main building is the mining annex, 80x60 feet, equipped with metallurgical machinery.

Three brick houses two stories in height are occupied as homes by the president and instructors.

A dormitory two stories in height built of gray stone of fine quality, originally provided as a home for male students, has been refitted for the use of young women. It contains a students' dining room, kitchen connected therewith, sixteen rooms each large enough to accommodate two students, and a reception room.

A fine brick dormitory containing forty rooms, with bath and toilet rooms, has been recently built for the use of male students and teachers.

A substantial brick building contains a suite of rooms for the use of the commercial assaying department, the rooms being furnished with a large melting furnace with necessary muffle furnaces and other accessories.

Joined in continuous structure with the assaying building are the shops of the manual training department, occupying an area 80x95 feet, containing a room for mechanical and free hand drawing, and the machinery and appliances for the working of wood and iron.

Other buildings are the boiler-house, which also contains the wells and pumps whereby the water supply for irrigation and general purposes is obtained; the new green-house, 80x21 feet; the old green-house, used as a propagating-house; the cottage occupied by the classes in domestic science; and a temporary wooden building used for various purposes.

The Twenty-first Legislative Assembly of Arizona has authorized the issuing of territorial bonds to the amount of \$25,000 for the purpose of constructing new buildings. It is expected that the erection of a library and museum building which will also contain administrative offices will be started as soon as this act of the Legislative Assembly shall be approved by Congress.

EQUIPMENT

LIBRARY

The library containing 6,000 bound volumes and 10,000 pamphlets is open to the use of all students. The books are new and standard. A valuable feature of the library is the collection of complete sets of scientific and literary periodicals, which are of special service in research work.

A complete title-and-subject card catalogue is maintained.

The reading-room is furnished with about seventy scientific, literary and general periodicals, besides the weekly territorial newspapers.

MUSEUM

The Seventeenth Legislative Assembly of Arizona passed an act establishing a general museum at the University. The object of the museum is to collect materials of all kinds illustrating the resources and development of Arizona, and particularly to preserve historical relics, including those pertaining to the aboriginal inhabitants.

Donations of specimens and collections will be received and acknowledged with thanks, but no special provision has yet been made by the Legislature for the support of this department aside from a small appropriation for the salary of a curator.

The collections now displayed at the University comprise representative series of minerals, ores and rocks of Arizona. Among these may be particularly mentioned superb specimens from the mines of the Copper Queen at Bisbee. There are also collections of typical rocks and minerals for comparison, and many specimens of ores from different parts of the United States and from abroad. Great numbers of valuable specimens are now stored in trays preparatory to classification and distribution in cases. It is desired to make the collection of ores and minerals fully represent the great mineral resources of Arizona.

The museum is indebted to Mr. Herbert Brown, curator, for a large and valuable collection of skins of the birds of Arizona, which he has deposited in the museum, as well as for a collection of ancient aboriginal pottery and other relics. The fossil skull and teeth of an elephant and other fragmentary remains of extinct animals sent from Yuma by Mr. Brown also deserve special mention.

Historical records of much value are gradually accumulating as a part of this museum, and an appeal is made to old settlers and others to bear this fact in mind when making disposition of articles bearing even remote relation to the early pioneers and their history. All records and data of any nature which can be gleaned are worthy of preservation, and we earnestly desire to have them placed at the University, where they will always be accessible for reference.

The professors at the University have the immediate care of the collections in their respective departments.

The museum has attained very considerable importance and value, and it is expected that it will be safely housed in a special museum building in the near future.

BIOLOGY

The biological laboratories occupy three rooms on the second floor of the south wing of the main building. The equipment is such as is required for modern instruction and research in the biological sciences. The library and apparatus are well selected and adapted to the region and the courses offered.

The collections possessed by this department form a very important part of its equipment. The herbarium consisting of fully 10,000 sheets of mounted plants, fifty cases of insects, articulate and disarticulate human skeletons, plaster and papier-maché models of the important structures of the human anatomy, duplicate material for study and dissection, and the unique flora and fauna of the mountain, mesa and lowland collecting grounds in close proximity to the institution offer very attractive opportunities for instruction and research.

CHEMISTRY

The chemical laboratories are two in number. That used for beginners in the study of general chemistry and qualitative analysis is on the second floor of the main building and is equipped for the experimental and theoretical study of chemical science.

The chemical apparatus and collections are adequate, the equipment is good and the arrangements are fairly satisfactory for this work.

The laboratory for quantitative analysis is on the first floor of the main building. It is provided with analytical and bullion balances of the latest model, and is equipped for the teaching of volumetric and gasometric analysis, blow-pipe analysis, metallurgical chemistry, and wet and fire assaying, including apparatus for the electrolytic determination of metals.

Both laboratories though fairly adequate for their work are overcrowded, and the time is hoped for when the institution will be possessed of a science building suitably constructed for these purposes.

The laboratory of the Experiment Station occupies three rooms on the first floor, being devoted to analytical work and chemical investigations relating to agriculture. Though not intended for the use of students it is of incidental value to the institution through the investigations which are here conducted.

PHYSICS

Three rooms on the first floor of the main building are set apart for the teaching of physics. The facilities for experimental demonstration of all important phenomena are very complete. The lecture-room is fitted with shutters so that it can be darkened. A beam of

sunlight directed by a fine clock heliostat outside may be thrown steadily across the lecture table for experiments on light, or use in connection with the solar lantern for a variety of other work. Adjacent to the lecture-room are the laboratory and apparatus-room. Both lecture-room and laboratory are supplied with water and gas.

ENGINEERING

In a partly developed territory like our own, the engineer is called upon for the solution of a great variety of problems in the various lines of civil, hydraulic, mechanical and mining engineering, and in many difficult situations he must depend upon his knowledge and inventive ingenuity to supplement a meager equipment. To prepare the engineering student for such experiences the apparatus in this department has been chosen with a view to giving him the greatest familiarity with the theory, construction and use of those instruments and machines which observation has shown to be of universal adoption in practical engineering work. Already liberal, it is constantly being enlarged. It embraces surveyors' and engineers' chains; standard field and pocket tapes; plain and solar compasses and transits; mining transits; engineers' levels; stadia level and transit rods; aneroid barometers; odometer; automatic water-registers; hook-gauges; three forms of current-meter; stop watch; meteorological instruments; drafting instruments; mechanical calculators; blue-print apparatus; a four and one-fourth inch astronomical telescope with equatorial mountings and accessories; celestial sphere; a seventy-five light Mather dynamo; a Westinghouse high-speed engine; pumps, steam-gauges, indicator and calorimeters.

AGRICULTURE AND HORTICULTURE

Because of the situation of the territorial University, the educational work in agriculture and horticulture has taken peculiar form, being largely conducted on the correspondence plan, particularly through the "Timely Hints for Farmers" issued under the auspices of the Experiment Station, but of distinct educational value. Three thousand farmers of the territory are reached regularly twice a month by timely publications on subjects of vital interest.

Small and well-selected agricultural libraries of slight cost have been forwarded to a considerable number who have expressed willingness to receive them.

It is believed that this method of dealing with our situation will become increasingly useful.

The equipment for agricultural instruction is good, consisting of an excellent seed collection, a green-house and gardens for experimental purposes containing many rare and interesting plants, and a well-selected agricultural library.

MINING AND METALLURGY

Attached to the main building is an annex or mill containing machinery and appliances for crushing, sampling, concentrating, amalgamating, leaching, chloriding, cyaniding, and for the electrical treatment of various kinds of ore in large or small lots. Power is furnished by a thirty-five horse-power engine.

The mill building has a storage capacity for ore of fifty to one hundred tons. A seven-inch by ten-inch Blake crusher is used for coarse crushing, and a Dodge crusher for finer work. Beneath the Blake crusher is a set of fourteen-inch by twenty-inch Cornish rolls from which the ore passes by a conveyor to the main elevator which carries it up thirty-one feet to the top of the mill. By means of slides and chutes the crushed ore may be sent at will to various machines to be tested by different methods. For concentration there are provided revolving sizing screens giving facilities for preparing six sizes, besides hydraulic separators for classifying slimes into three grades. The coarser sizes may be worked upon full-sized jigging machines of the Hartz pattern, the finer sizes being jigged upon bottom discharge machines, and the slime worked upon a double Rittinger percussion table, or otherwise as desired. Amalgamation tests may be made upon a working scale by different methods, including plates and riffles, pans and settlers, etc. A five-stamp gold mill, with silvered plates and aprons of the latest and most approved construction, by Fraser & Chalmers of Chicago, permits the working of free-milling gold ores by the usual methods and on a large scale. Several lots of ore have been successfully worked and returns made in gold bullion. In addition to the five-stamp mill, a smaller prospecting mill of three stamps has been added so as to work small lots of ore of from 100 to 500 pounds.

The assay laboratory is equipped with assay furnaces for crucible work, for scorifying and cupeling, and for retorting mercury from amalgam, besides all needed appliances for assaying by dry and wet methods, including electrolysis. The laboratory also has

desks and fittings for the chemical work required in the metallurgical and mineralogical investigation and analysis of ores, mineral fertilizers and in qualitative tests of minerals.

MANUAL TRAINING

The manual training building, completed this year large through the generosity of the Copper Queen Consolidated Mining Company, has a total floor area of 7,900 square feet, divided as follows: Power room and draughting room, each 1,200 square feet; wood-working shop, forge shop and machine shop, each 1,400 square feet; wash room, 600, model room, 400, and store room 300 square feet.

Each shop provides working space for twenty-four students benches or forges, and ample space for machines and tool room. The draughting room accommodates thirty-six students.

The power room contains two engines, a dynamo, a blower and an exhaustor.

The wood-working shop is equipped with a full assortment of hand tools, four wood-turning lathes, a universal wood-worker, dimension sawing machine and other modern wood-working appliances.

The forge shop contains twenty-four down draught forges, twenty-four anvils, a blacksmith drill-press and all necessary small tools.

The machine shop contains two engine lathes, a shaper, planer, universal milling machine, twenty-four inch drill, grindstone, vises and small tools. Other machinery is constantly being added.

The entire building is well lighted and ventilated and the draughting room is heated by steam.

GENERAL INFORMATION

REGISTRATION

All students are required to register on registration day at the beginning of the year in the president's office. A matriculation fee of \$5.00 is required of all students. No student will be registered until the matriculation fee has been paid. After registration no change in classes can be made without the consent of the committee on registration.

RECORDS

The class standing of each student is determined by the instructor in charge. The method of ascertaining the student's record is left to the instructor and his report in all cases is final.

Reports of standing in classes are sent each month from the president's office to parents or guardians. Those to whom these reports are addressed are urgently requested to examine each with care and to spur up delinquent students or commend those who are diligent, as the case may be. Without such hearty co-operation good results cannot be anticipated.

DISCIPLINE

It is earnestly desired that students may be influenced to good conduct by higher motives than fear of punishment. The sense of duty and honor, the courtesy characteristic of ladies and gentlemen are appealed to as the best regulators of conduct. It is the policy of the University to allow as much liberty as will not be abused; but good order will be strictly maintained, and misconduct punished by adequate penalties. Frequenting saloons or billiard rooms, or any conduct harmful to the moral standing of the school will render the student liable to punishment, and in aggravated cases to expulsion. Any attempt on the part of a student to present as his own the work of another, or to pass any test or examination by unfair means considered a most serious offense. In case of expulsion a student required by law to surrender to the University his cadet uniform.

Students or classes desiring to make requests of the faculty may do so; but to insure immediate action it is necessary for them to

file their petition in the president's office before the hour of faculty meeting, and class petitions must be presented at least two days before the time of meeting.

VACATIONS AND HOLIDAYS

A short recess (see calendar, page 2) is taken at Christmas time. The long summer vacation begins about June 1st, and continues until near the close of September. The Thanksgiving recess extends from the close of the regular exercises on the Wednesday before Thanksgiving to the next Monday morning.

All legal holidays are observed by the cessation of ordinary University work.

Appropriate exercises in which the students will be expected to join if required may be arranged by the faculty for any legal holiday.

Arbor day has been formally adopted by the University regents as the regular anniversary on which shall be celebrated the founding of the institution, in connection with the ceremonies of tree planting.

LIVING ACCOMMODATIONS

Provision is made as far as possible for furnishing board and rooms to students of both sexes upon the University grounds.

Young men have excellent quarters in South Hall, a new dormitory building.

North Hall, the home of the young ladies, is in charge of an experienced and capable preceptress who has constant supervision of those rooming there.

Rooms contain a clothes press, and are provided with single bedsteads, table, chairs, mirror, wash-bowl, pitcher and slop jar. Students will supply their own lamps, brooms, mattresses, pillows, sheets, blankets, towels, napkins, rugs and such other articles as they may desire for ornamenting their rooms. They will care for their own rooms under the direction of the instructor in charge.

FEES AND EXPENSES

	Lowest.	Highest.
Tuition, free		
Matriculation (paid but once)	\$ 5.00	\$ 5.00
Laboratory and shop fees, varying according to		
courses, per annum	1.00	25.00
Books, per annum	5.00	20.00
Board, per month	15.00	18.00
Nights per room, per month	.25	1.00

By resolution of the board of regents of the University, board fees to be paid in advance at the beginning of each month. Checks, postoffice or express money orders should be made payable to the resident. No reduction will be made for absence for a period of less than one week.

Text-books required are obtained directly from the publishers through a book association managed on the co-operative plan under the direction of the faculty.

Members of the battalion will be required to provide themselves with the prescribed uniform, which may be obtained at the University. The cost of uniform including transportation charges has been \$16.25. This uniform has shown better wearing qualities than civilian suit of equal cost, and parents are urged to consider the matter of uniform when supplying their sons with clothing for the approaching school year. It may be worn on all occasions and thus will remove the necessity for the usual expenditures for outer clothing other than overcoats.

Provision has been made to a limited extent for the self-support of students.

RAILROAD RATES

The Southern Pacific, the Maricopa, Phoenix & Salt River Valley, the Santa Fe, Prescott & Phoenix, and the Gila Valley, Globe & Northern railways have all generously allowed students in attendance upon the University half rates when journeying to and from their homes. In the case of students coming to the University, these half rates may be secured by notifying the president of the University a sufficient length of time in advance to enable him to secure the permits from the proper authorities. Students at the University may secure transportation to their homes and return at

any time by making application at the office of the president of the University.

LITERARY SOCIETY

The Philomathean Society, an organization open to all students, holds its meetings in the assembly room of the University. Its work embraces general literary exercises and parliamentary usage and is a valuable adjunct to the regular college course.

ATHLETICS

Encouragement is given to athletics, and athletic organizations are under the immediate care of a committee of the faculty. Membership in these organizations is subject to forfeiture for failure in regular school work.

REQUIREMENTS FOR ADMISSION

Applicants for admission to any department of the University will be required to furnish satisfactory evidence of good moral character, and of honorable dismissal from the schools with which they were last connected.

Beginning with September, 1903, for admission to the Freshman class, applicants must be at least sixteen years of age and must pass satisfactory examinations in subjects sufficient to give fifteen credits as described below. Until 1903 twelve credits will be accepted. One study pursued satisfactorily for one year, one period a day, as ordinarily taught in high schools, entitles a student to one credit.

For admission to the course leading to the degree of Bachelor of Philosophy the subjects upon which examinations must be passed, and the credits assigned each, are:

Credits.						Credits.					
English	..	..	..	..	3	Latin	..	..	..	..	3
Mathematics	..	..	..	..	3	French or German	..	..	..	2	
General History and						Science	..	..	..	..	1
Civics	..	..	..	..	1	Elective	..	..	..	..	2

For admission to the course leading to the degree of Bachelor of Science the subjects upon which examinations must be passed, and the credit assigned each, are:

	Credits.		Credits.
English	3	French or German.. .. .	2
Mathematics	3	Science	3
General History and Civics. 1		Elective	3

The scope of work required in these various subjects is as follows:

ENGLISH—A competent knowledge of the elements of English grammar, composition, the elements of rhetoric and the following English classics or acceptable equivalents: Longfellow's Evangeline; Irving's Sketch Book; Scott's Ivanhoe and Lady of the Lake; Webster's First Bunker Hill Monument Oration; Lowell's Vision of Sir Launfal; Whittier's Snow-Bound; the Sir Roger de Coverley Papers in "The Spectator"; Shakespeare's Julius Cæsar and Merchant of Venice; Macaulay's Warren Hastings; George Eliot's Silas Marner; Syle's From Milton to Tennyson (ten poems).

In 1903 the requirements for admission will be the same as above for grammar, composition and the elements of rhetoric with the following English classics: The Sir Roger de Coverley Papers "The Spectator"; Goldsmith's Vicar of Wakefield; Tennyson's Incess; Scott's Ivanhoe; George Eliot's Silas Marner; Coleridge's Rime of the Ancient Mariner; Shakespeare's Merchant of Venice and Julius Cæsar; Carlyle's Essay on Burns; Lowell's Vision of Sir Launfal; Macaulay's Essays on Milton and Addison.

MATHEMATICS—Arithmetic as covered in White's Advanced Arithmetic to the appendix, but these subjects will be omitted in the entrance examinations: longitude and time, present worth, stock investments, exchange, equation of payments, compound proportion, partnership and cube root. Algebra, through quadratic equations, as given in Wells's Essentials of Algebra, or Wentworth's New School Algebra. Plane geometry as treated in the latest editions of Wentworth or Wells.

GENERAL HISTORY AND CIVICS—As much as is included in Adams's European History and Fiske's Civil Government in the United States or text-books covering equivalent ground.

***LATIN**—As covered by Collar's First Latin Book and Viri-mæ, together with Allen and Greenough's Grammar and texts;

sight reading; *Cæsar*, four books; *Cicero*, four orations; *Vergil*, six books; sight reading from *Nepos*, *Cicero* and *Gellius*; *Daniell's* or *Bennett's Prose Composition*.

*FRENCH—As covered by *Whitney's French Grammar*, parts I and II; composition; *Super's French Reader*; *Halévy, L'Abbé Constantin*; *Sand, Le Mare du Diable*; *Jean de la Bréte, Mon Oncle et Mon Curé*; and at least 400 pages from five different authors.

*GERMAN—As covered by *Whitney's German Grammar*; composition; *Heath's first year texts*; together with *Riehl, Der Fluch der Schönheit*; *Schiller, Marie Stuart* and *Jungfrau von Orleans*; *Goethe, Hermann und Dorothea, Iphigenia*; *Lessing, Minna von Barnhelm*.

SCIENCE—Under this head may be offered the required number of credits in the following subjects: physical geography, physiology, botany, chemistry, physics. At least half the preparation in science should consist of laboratory work. Note-books covering such laboratory work as has been performed by the student should be presented for examination.

ELECTIVE—The remaining credits required may be made up from additional subjects ordinarily taught in high schools.

Students from other institutions of equivalent rank may be admitted to the higher classes upon the presentation of properly authenticated certificates showing to the satisfaction of the faculty that they are qualified to proceed with the desired work.

Arrangements have been made with the *Arizona Normal School* at Tempe, whereby students from that institution may have their record transferred to the books of the University with full credit upon presentation of a certificate duly signed by the principal. Students of this University may also obtain the equivalent privilege at the Normal School by presenting the proper certificate of standing, signed by the president.

The faculty desires to establish such relations with high schools and other educational institutions as will enable it to accept their certificates without question. To this end presiding officers are respectfully requested to correspond with the president.

*If any language is offered it must be to the extent of two credits, since a single year's study of a language is not considered of sufficient educational value to be entitled to credit.

COURSES OF STUDY AND DEGREES

All facilities and privileges of the University are open to qualified persons of either sex.

The University offers four-year courses of study leading to the degrees of Bachelor of Philosophy and Bachelor of Science. In each course the work is partly required and partly elective, as shown by schedules later. Each student taking full work is required to take four hours of recitation work each day. In laboratory work from two to two and one-half hours are considered the equivalent of one recitation hour.

Persons of mature age and with sufficient preparation who are not candidates for a degree will in some cases be admitted to regular classes as special students provided, however, that in all such cases they show to the satisfaction of the instructors in charge that they can take the work with profit to themselves and without detriment to the work of the regular class.

The faculty reserves the right to omit classes in any course of instruction unless a suitable number of students register for the course.

Students who have completed satisfactorily the required work and the specified amount of elective work as shown in the accompanying schedules will be given the degrees of Bachelor of Philosophy or Bachelor of Science. The special character of any course of study may be indicated by adding to the degree the name of the department, as: Bachelor of Science in Mining, or Bachelor of Science in Chemistry, etc.

Each candidate for graduation is required to present an acceptable thesis embodying the results of a special study of some subject within the range of the course pursued. The subject of the thesis must be submitted for the approval of the faculty not later than the opening of the second semester of the Senior year and the completed thesis must be presented not later than three weeks before commencement day.

The advanced degrees of Master of Science and Master of Arts will be conferred upon Bachelors, graduates from this University or from institutions of equivalent grade, who have successfully pursued at the University a course of study marked out by the faculty and requiring not less than one year.

COURSES OF INSTRUCTION

The following schedule shows the courses in which instruction is offered. The courses themselves are explained later.

Military science and tactics or physical culture is required during the Freshman and Sophomore years. If for any reason a student is excused from these exercises an additional subject having a minimum of three recitation hours per week will be required.

Numbers within parentheses indicate hours of recitation per week; when no number is given five hours per week is understood.

FRESHMAN YEAR

Military Science and Tactics (4)	German 1, 2
Physical Culture (4)	Spanish 1, 2
English 1, 2	History 1, 2
Mathematics 1, 2	Botany 1, 2
Latin 1, 2	Drawing 1, 2
French 1, 2	Shopwork and Drawing 1, 2
Oratory 1, 2 (2)	Descriptive Geometry 1, 2

SOPHOMORE YEAR

Military Science and Tactics (4)	Spanish 3, 4 (4)
Physical Culture (4)	Botany 3, 4
English 3, 4 (3)	Chemistry 1, 2
Mathematics 3, 4	History 3, 4 (2)
Latin 3, 4 (4)	Surveying 1, 2
French 3, 4 (4)	Physics 1
German 3, 4 (4)	Shopwork and Drawing 3, 4
Oratory 3, 4 (2)	

JUNIOR YEAR

Military Science and Tactics (4)	Zoölogy 1, 2
Physical Culture (4)	Mineralogy 1
English 5, 6 (3)	History 5, 6 (3)
English 7, 8 (2)	History 7, 8 (2)
Mathematics 5, 6	Chemistry 3, 4
Economics 1, 2 (2)	Metallurgy 1
Economics 3, 4 (3)	Drawing 3, 4

SENIOR YEAR

Military Science and Tactics (4)	Ethics 1
Physical Culture (4)	Metallurgical Chemistry and As-
English 9, 10 (2)	saying 1, 2
English 11, 12 (3)	Steam Engineering and Prime
Psychology 1	Movers 1, 2
Pedagogy 1	Engineering Construction and
History 9, 10 (3)	Hydraulics 1, 2
Astronomy and Geology 1, 2	Mine Engineering 1
Logic 1	

CREDITS FOR DEGREES

A CREDIT consists of one subject taken five hours per week throughout the year, or an equivalent of five hours per week. Sixteen credits besides Military Science and Tactics or Physical Culture are required for graduation in any course. Credits offered in the different subjects are shown in the following scheme:

	Credits.	GROUP C.	Credits.
English	4	Botany	2
Laboratory	1	Zoölogy	1
Mathematics	4	Chemistry	2
GROUP A.		Met. Chem. and Ass'ng. ..	1
Latin	2	Astronomy and Geology ..	1
French	2	Mineralogy	½
German	2	Physics	½
Spanish	2		
GROUP B.		GROUP D.	
History	3	Drawing	3
Economics	1	Shop and Drawing	2
Philosophy	2	Engineering	3

The credits necessary for the degree of Bachelor of Philosophy are as follows:

- I. Required,—English 3 credits, Philosophy 2 credits, History and Economics 1 credit.
- II. Group Electives,—From Group A 4 credits, from Group C 2 credits.
- III. Free Electives,—4 credits.

The credits necessary for the degree of Bachelor of Science are as follows:

- I. Required,—English 1 credit, Mathematics 2 credits.
- II. Group Electives,—From Group A 1 credit, from Group B 1 credit, from Group C 4 credits, from Group D 3 credits.
- III. Free Electives,—4 credits.

Women desiring the degree of Bachelor of Science may be allowed to substitute two credits in Group C or in Mathematics for two credits of those required in Group D.

To obtain the degree of Bachelor of Science *in Mining* the following courses must have been elected:

Shop and Drawing 1, 2; Surveying 1, 2; Mine Engineering 1; Metallurgy 1; Mineralogy 1; Astronomy and Geology 1, 2; Chemistry 3, 4; Steam Engineering and Prime Movers 1, 2; Engineering Construction and Hydraulics 1, 2.

To obtain the degree Bachelor of Science *in Agriculture* the following course is required:

FRESHMAN YEAR—English, Solid Geometry, Trigonometry, Higher Algebra, Modern Language, Shopwork and Drawing.

SOPHOMORE YEAR—Higher Algebra, Analytic Geometry, Meteorology, Chemistry, Surveying, Botany, Drawing, Farm Equipment, Soil and Irrigation.

JUNIOR YEAR—Farm Crops, Breeds of Live Stock, Botany, Anatomy, Zoölogy, Entomology, Floriculture, Landscape Gardening, Forestry, Horticulture.

SENIOR YEAR—Stock Breeding and Feeding, Dairying, Veterinary Medicine, Geology, Fruits and Fruit Culture, Vegetables and Vegetable Culture.

FRIDAY

I 9:0-9:50	†Psychology †Pedagogy English 1 Mathematics *History	†Psychology 1 †Pedagogy 1 English 1, 2 Mathematics 5, 6 *History 5, 6 †French 3, 4 *German 3, 4 Spanish 3, 4
II 10:10:40	Mathematics †Drawing Chemistry Met. Chemistry 1, 2 *Economics English 3	Mathematics 1, 2 †Drawing 1, 2 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 *Economics 3, 4 English 3, 4
II 11:30	Mathematics Chemistry Met. Chemistry 1, 2 Botany 3 History 1 English 5 *Descriptive 1, 2	Mathematics 3, 4 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 Botany 3, 4 History 1, 2 English 5, 6 *Descriptive Geometry 1, 2
V 12:15	English 1 Astronomy 1, 2 Mineralogy Botany 3, *French 1 †German Spanish 1	English 11, 12 Astronomy and Geology 1, 2 Mineralogy 1 Botany 3, 4 *French 1, 2 †German 1, 2 Spanish 1, 2
1:50 rk	†Logic 1 †Ethics 1 *Surveying *Steam Engines 1, 2 Shop and 2 †Physics 1 Zoology 1, Oratory 1, Latin 1, 2	†Logic 1 †Ethics 1 *Surveying 1, 2 *Steam Eng.; Pr. Movers 1, 2 Shop and Drawing 1, 2 †Physics 1 Zoology 1, 2 Latin 1, 2
2:40	Chemistry Zoology 1, Botany 1, †Mine Eng †Metallurgy Shop and 2 Shop and 4 *Eng. Constr. 1, 2 *History 9 Latin 3, 4	Chemistry 1, 2 Zoology 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 1, 2 Shop and Drawing 3, 4 *Eng. Const. and Hydr. 1, 2 *History 9, 10 Latin 3, 4
3:40	Chemistry Botany 1, †Mine Eng †Metallurgy Shop and 4 Drawing 3	Chemistry 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 3, 4 Drawing 3, 4 Oratory 3, 4

Classes marked thus * hereafter. Military Science is held at 8:00 a. m. on Monday, Tuesday, Wednesday.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
50	†Psychology 1 †Pedagogy 1 English 1, 2 Mathematics 5, 6 *History 5, 6	†Psychology 1 †Pedagogy 1 English 1, 2 Mathematics 5, 6 *History 7, 8 †French 3, 4 *German 3, 4 Spanish 3, 4	†Psychology 1 †Pedagogy 1 English 1, 2 Mathematics 5, 6 *History 5, 6 †French 3, 4 *German 3, 4 Spanish 3, 4	†Psychology 1 †Pedagogy 1 English 1, 2 Mathematics 5, 6 *History 7, 8 †French 3, 4 *German 3, 4 Spanish 3, 4	†Psychology 1 †Pedagogy 1 English 1, 2 Mathematics 5, 6 *History 5, 6 †French 3, 4 *German 3, 4 Spanish 3, 4
40	Mathematics 1, 2 †Drawing 1, 2 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 *Economics 3, 4 English 3, 4	Mathematics 1, 2 †Drawing 1, 2 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 *Economics 1, 2 †History 3, 4	Mathematics 1, 2 †Drawing 1, 2 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 *Economics 3, 4 English 3, 4	Mathematics 1, 2 †Drawing 1, 2 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 *Economics 1, 2 †History 3, 4	Mathematics 1, 2 †Drawing 1, 2 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 *Economics 3, 4 English 3, 4
30	Mathematics 3, 4 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 Botany 3, 4 History 1, 2 English 5, 6 *Descriptive Geometry 1, 2	Mathematics 3, 4 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 Botany 3, 4 History 1, 2 English 7, 8 *Descriptive Geometry 1, 2	Mathematics 3, 4 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 Botany 3, 4 History 1, 2 English 5, 6 *Descriptive Geometry 1, 2	Mathematics 3, 4 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 Botany 3, 4 History 1, 2 English 7, 8 *Descriptive Geometry 1, 2	Mathematics 3, 4 Chemistry 3, 4 Met. Chem. and Assaying 1, 2 Botany 3, 4 History 1, 2 English 5, 6 *Descriptive Geometry 1, 2
15	English 11, 12 Astronomy and Geology 1, 2 Mineralogy 1 Botany 3, 4 *French 1, 2 †German 1, 2 Spanish 1, 2	English 9, 10 Astronomy and Geology 1, 2 Mineralogy 1 Botany 3, 4 *French 1, 2 †German 1, 2 Spanish 1, 2	English 11, 12 Astronomy and Geology 1, 2 Mineralogy 1 Botany 3, 4 *French 1, 2 †German 1, 2 Spanish 1, 2	English 9, 10 Astronomy and Geology 1, 2 Mineralogy 1 Botany 3, 4 *French 1, 2 †German 1, 2 Spanish 1, 2	English 11, 12 Astronomy and Geology 1, 2 Mineralogy 1 Botany 3, 4 *French 1, 2 †German 1, 2 Spanish 1, 2
0	†Logic 1 †Ethics 1 *Surveying 1, 2 *Steam Eng.; Pr. Movers 1, 2 Shop and Drawing 1, 2 †Physics 1 Zoology 1, 2 Oratory 1, 2 Latin 1, 2	†Logic 1 †Ethics 1 *Surveying 1, 2 *Steam Eng.; Pr. Movers 1, 2 Shop and Drawing 1, 2 †Physics 1 Zoology 1, 2 Latin 1, 2	†Logic 1 †Ethics 1 *Surveying 1, 2 *Steam Eng.; Pr. Movers 1, 2 Shop and Drawing 1, 2 †Physics 1 Zoology 1, 2 Latin 1, 2	†Logic 1 †Ethics 1 *Surveying 1, 2 *Steam Eng.; Pr. Movers 1, 2 Shop and Drawing 1, 2 †Physics 1 Zoology 1, 2 Oratory 1, 2 Latin 1, 2	†Logic 1 †Ethics 1 *Surveying 1, 2 *Steam Eng.; Pr. Movers 1, 2 Shop and Drawing 1, 2 †Physics 1 Zoology 1, 2 Latin 1, 2
0	Chemistry 1, 2 Zoology 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 1, 2 Shop and Drawing 3, 4 *Eng. Const. and Hydr. 1, 2 *History 9, 10 Latin 3, 4	Chemistry 1, 2 Zoology 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 1, 2 Shop and Drawing 3, 4 *Eng. Const. and Hydr. 1, 2 Latin 3, 4	Chemistry 1, 2 Zoology 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 1, 2 Shop and Drawing 3, 4 *Eng. Const. and Hydr. 1, 2 *History 9, 10 Latin 3, 4	Chemistry 1, 2 Zoology 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 1, 2 Shop and Drawing 3, 4 *Eng. Const. and Hydr. 1, 2 Latin 3, 4	Chemistry 1, 2 Zoology 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 1, 2 Shop and Drawing 3, 4 *Eng. Const. and Hydr. 1, 2 *History 9, 10 Latin 3, 4
0	Chemistry 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 3, 4 Drawing 3, 4	Chemistry 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 3, 4 Drawing 3, 4 Oratory 3, 4	Chemistry 1, 2 Botany 1, 2 †Mine Engineering 1 Shop and Drawing 3, 4 Drawing 3, 4	Chemistry 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 3, 4 Drawing 3, 4	Chemistry 1, 2 Botany 1, 2 †Mine Engineering 1 †Metallurgy 1 Shop and Drawing 3, 4 Drawing 3, 4 Oratory 3, 4

marked thus * were given in 1900-01, and will be given each alternate year. Courses marked † will be given 1901-02 and each alternate year thereafter. Military Science is held at 8:00 a. m. Tuesday, Wednesday and Thursday. Physical Culture begins at 8:30 on the same days. Assembly for all students is held at 8:30 a. m. on Friday.

EXPLANATION OF COURSES OF INSTRUCTION

(The hours mentioned are the hours of recitation per week.)

ENGLISH

PROFESSOR HALL, ASSOCIATE PROFESSOR PLIMPTON.

The purpose of the courses outlined below is to give a general knowledge of English literature from the sixteenth century to the present time. Chief stress is placed upon the study of a few authors of the most important periods, though the history of our literature is also traced from age to age.

The course in composition aims to develop accurate thought and clear, vigorous expression.

ENGLISH 1, 2. NINETEENTH CENTURY PROSE AND BRIEF HISTORY.

a—Appreciative, sympathetic criticism of a few prose writers, chiefly Macaulay, Carlyle, Emerson, DeQuincey, Ruskin and the foremost novelists. Lectures and discussions. *b*—A brief survey of the field of English literature. Stopford Brooke's *English Literature* with reading, lectures and discussions. Open to all students. *Five hours both semesters.* (Hall.)

ENGLISH 3, 4. RHETORIC AND COMPOSITION.—Expository and argumentative composition; briefs, themes, essays. Lectures and discussions; Genung's *Practical Rhetoric and Rhetorical Analysis*; Baker's *Specimens of Argumentation* (modern). Open to students who have taken English 1, 2. *Three hours both semesters.* (Plimpton.)

ENGLISH 5, 6. ELIZABETHAN LITERATURE.—Shakespeare, selected plays; other Elizabethan drama, especially Jonson and Marlowe; Spenser's *Faerie Queene* and shorter poems. Lectures and discussions. Open to students who have taken English 1, 2. *Three hours both semesters.* (Plimpton.)

ENGLISH 7, 8. EIGHTEENTH CENTURY LITERATURE.—From the death of Dryden to the publication of the *Lyrical Ballads*, 1700-1798; special attention given to the Queen Anne period and the early romantic revival. Lectures and discussions. *Two hours both semesters.* (Plimpton.)

ENGLISH 9, 10. SEVENTEENTH CENTURY LITERATURE.—From the closing of the theaters to the death of Dryden, 1642-1700. Lec-

tures and discussions. Open to students who have taken English 1,
2. *Two hours both semesters.* (Hall.)

ENGLISH 11, 12. NINETEENTH CENTURY POETRY.—From the publication of the Lyrical Ballads to the death of Tennyson, 1798-1892. Lectures and discussions; Macmillan's Globe editions. Open to students who have taken English 1, 2. *Three hours both semesters.* (Hall.)

RHETORICALS.—The appearance in public rhetorical exercises once during each semester is required of all students taking a University course in English, or taking any course of study leading to a degree. (Hall.)

LATIN

INSTRUCTOR FOUCAR.

The courses below are open to students who have completed the first two years of Latin in the sub-collegiate department, or an equivalent. The aim of the instruction is to impart a comprehensive knowledge of the language and literature. Constant, thorough drills are given in technical grammar and prose composition. In reading the matter is subjected to grammatical, metrical, rhetorical and historical explanation. The study of the text is made the means of mental discipline, of developing the faculties of observation and critical judgment, and of acquiring habits of thoroughness and accuracy.

LATIN 1, 2. CICERO AND VERGIL.—Cicero's Orations, the four Catilinarian; Vergil's Aeneid, six books. Allen and Greenough's texts. Sight-reading from Nepos, Gellius and Cicero; Daniell's Prose Composition throughout the year. *Five hours both semesters.*

LATIN 3, 4. LIVY, HORACE, CICERO.—Livy, Book XXI; Horace selected Odes, Satires; Cicero, De Amicitia and De Senectute; Latin prose composition and sight-reading. Open to students who have taken Latin 1, 2. *Four hours both semesters.*

FRENCH

INSTRUCTOR PLIMPTON.

The object of the courses in French is to give the student a practical knowledge of French forms, syntax and pronunciation.

Translating from English into French forms a large part of the work. The reading of numerous works of standard authors is designed to enlarge the student's vocabulary, and to give him an appreciative acquaintance with the genius of the language and literature.

FRENCH 1, 2.—Whitney's French Grammar, Part I; Super's French Reader; Halévy's *L'Abbé Constantin*; Sand's *Le Mare au Diable*; Jean de la Bréte, *Mon Oncle et Mon Curé*. Open to all students. *Five hours both semesters.*

FRENCH 3, 4.—Whitney's French Grammar, Part II; selected masterpieces of eighteenth and nineteenth century authors. Lectures; collateral reading. Open to students who have taken French 1, 2. *Four hours both semesters.*

GERMAN

INSTRUCTOR PLIMPTON.

The object of the courses in German is to enable the student to gain rapidly a practical knowledge and use of the German language, a facility in translating, and an intelligent acquaintance with German literature. Special attention is given to grammatical structure, pronunciation, the acquiring of vocabulary and the mastery of idioms. In the reading, the aim is also a study of the form and thought of the works selected.

GERMAN 1, 2.—Whitney's German Grammar; Heath's first-year texts. Open to all students. *Five hours both semesters.*

GERMAN 3, 4.—Riehl's *Der Fluch der Schönheit*; Lessing's *Minna von Barnhelm*; Schiller's *Marie Stuart*, *Jungfrau von Orleans*; Goethe's *Hermann und Dorothea*, *Iphigenia*. Composition; collateral reading; essay writing. Open to students who have taken German 1, 2. *Four hours both semesters.*

SPANISH

INSTRUCTOR AGUIRRE.

The courses outlined below aim to give thorough instruction in Spanish grammar, and in reading, writing and speaking the language.

SPANISH 1, 2—De Tornos's Combined Spanish Method ; selections from *Cartillas Historicas*. Much attention is given to writing and speaking Spanish. Open to all students. *Five hours both semesters.*

SPANISH 3, 4—Reading and speaking the Spanish language ; much practice in composition and letter writing will be given, and selections from different authors read in class. Spanish will be the language of the class room. Open to students who have taken Spanish 1, 2. *Four hours both semesters.*

HISTORY, POLITICAL SCIENCE AND PHILOSOPHY

PROFESSOR ADAMS.

HISTORY

In the work in history emphasis is placed on the social and political development, the relation of cause and effect and the unity of history. The laboratory method is used wherever possible and individual work insisted upon. In political science the historical method is used, and the *subject* rather than any one writer's presentation of it is treated. After a brief presentation of pure economics, the course deals with practical questions.

HISTORY 1, 2. ENGLISH HISTORY.—Green's Short History of the English People used as a basis ; much assigned reading. A thesis is required. Open to all students. *Five hours both semesters.*

HISTORY 3, 4. AMERICAN COLONIAL HISTORY.—A detailed study of the American colonies under Great Britain, and of the United States to the adoption of the Constitution. Lectures and assigned reading. A thesis is required. Open to students who have taken History 1, 2. *Two hours both semesters.*

HISTORY 5, 6. ECONOMIC HISTORY OF THE UNITED STATES.—A study of the course, manner and development of the economic history of the United States. Lectures and assigned reading. A thesis is required. Open to students who have taken History 1, 2. *Three hours both semesters.*

HISTORY 7, 8. SPANISH AMERICAN HISTORY.—Spanish settlement and administration during the colonial period ; the growth and development of the Southwest, with special reference to Arizona. Lectures and assigned reading. Open to all students. *Two hours both semesters.*

HISTORY 9, 10. CONSTITUTIONAL HISTORY OF THE UNITED STATES.—A detailed study of the formation of the Union, and of the political and constitutional history of the United States, based on letters and speeches of American statesmen, public documents and special histories. A thesis is required. Open to students who have taken History 3, 4. *Three hours both semesters.*

POLITICAL SCIENCE

ECONOMICS 1, 2.—A study of the general principles and laws of political economy. Text-book, Walker's Advanced Political Economy. Open to Juniors and Seniors. *Two hours both semesters.*

ECONOMICS 3, 4.—A study of economic and sociologic problems, such as the currency question, tariff reform, banking, taxation and similar subjects. Lectures and assigned reading. A thesis is required. To be preceded or accompanied by Economics 1, 2. *Three hours both semesters.*

PHILOSOPHY

PSYCHOLOGY 1.—A special consideration of the subject as applied to teaching. Lectures, recitations and collateral reading. Open to Juniors and Seniors. *Five hours first semester.*

PEDAGOGY 1.—An account of educational evolution, both as a culture fact in the history of civilization and as a foundation for professional work; lectures, giving a brief but comprehensive outline of the school systems of ancient, mediæval and modern countries with a special study of leading educators, such as Socrates, Comenius, Pestalozzi, Froebel, Mann and others; the present trend of pedagogical thought and practice, methods of teaching, school management, art of questioning and school law. Upon the completion of this course, graduates of the University will receive a Territorial Teacher's Certificate. Open to students who have taken Psychology 1. *Five hours second semester.*

LOGIC 1.—Text-book, Jevons's Logic; reading from Mill, Hamilton, Thomson and others. Open to Juniors and Seniors. *Five hours first semester.*
(Professor Woodward.)

ETHICS 1.—Theoretical and practical ethics; view of the historical development of the science; origin and development of the

moral consciousness; application of the principles of ethics to the problems of life. Lectures and discussions. Open to Juniors and Seniors. *Five hours second semester.* (President Parker.)

MATHEMATICS

PROFESSOR WOODWARD, PROFESSOR SMITH.

It is the aim of the work in mathematics to train the student to the habit of logical and vigorous courses of reasoning, to show the wonderful breadth of application of higher mathematics, to display the beauties and pleasures of the demonstrations, methods, and results of higher geometry and calculus, and to give such practice in the use of these agents as will enable students who pursue the higher branches of engineering to use them naturally and easily in those numberless applications where they are indispensable.

MATHEMATICS 1, 2. SOLID GEOMETRY: HIGHER ALGEBRA.—Geometry one-third year; text-book, Phillips and Fisher's Elements of Geometry. Algebra two-thirds year; text book, Downey's Higher Algebra. Open to all students. *Five hours both semesters.*

MATHEMATICS 3, 4. TRIGONOMETRY: ANALYTIC GEOMETRY.—Trigonometry one-third year; text-book, Wells's Essentials of Trigonometry. Analytic Geometry two-thirds year; text-book, Nichols's Analytic Geometry. Open to all students who have taken Mathematics 1, 2. *Five hours both semesters.*

MATHEMATICS 5, 6. CALCULUS: MECHANICS.—Calculus first semester, differential and integral, with special reference to their use in the various branches of engineering. Lectures and recitations; text-book, Hall's Differential and Integral Calculus. Mechanics second semester; composition and resolution of forces; energy; revolving bodies; moment of inertia; impact; stress and strain in materials; graphical and analytical determination of stresses in ties, beams, columns, shafting, and in the members of bridge and roof trusses. Open to students who have taken Mathematics 3, 4. *Five hours both semesters.*

BIOLOGY

PROFESSOR GRIFFITHS.

The courses which follow are calculated to articulate with the work done in biology in average western high schools.

BOTANY 1, 2. ELEMENTARY BOTANY.—The general principles of plant morphology, physiology and histology; a knowledge of the more important functions in the vital economy of plant life, followed by a study of the types of the more important groups; a general survey of the plant kingdom. Guide, Atkinson's Botany, supplemented by other texts and lectures. The laboratory studies will form the basis of all the work. Open to all students. *Five hours, or an equivalent, both semesters.*

BOTANY 3, 4. ADVANCED BOTANY.—The second year's work is not definitely outlined, but is purposely left open to be formulated as the needs of the students applying appear to demand. Courses in general morphology of the fungi; morphology of the fungi with special reference to parasitic forms injurious to vegetation in the southwest; histology; physiology, and similar subjects are offered here. Opportunities and facilities are offered for research work. Open to students who have taken Botany 1, 2. *Five hours, or an equivalent, both semesters.*

ZOOLOGY 1, 2 —Conducted along lines corresponding very closely to those followed in Botany 1, 2. Laboratory studies as in that course are made the main feature of the work. This is based upon living, native material where such is available; but some groups are necessarily studied by the aid of preserved specimens. In the study of the Mammalia constant reference is made to human anatomy, so that this portion is made in a part review of the course in anatomy and physiology offered in the sub-collegiate department. Text-book, Parker and Hazwell's Manual of Zoölogy. Open to all students. *Five hours, or an equivalent, both semesters.*

PHYSICS

PROFESSOR SMITH.

It is the object of this course to familiarize the student with the physical principles which underlie the higher courses of mechanics, thermodynamics, chemistry and engineering; and therefore special attention is given to the study of force and work, the physics of liquids and gases, and heat.

PHYSICS 1.—Lectures, recitations and laboratory work. Open to students who have taken a course in elementary physics, and Mathematics 1, 2. *Three hours, or an equivalent, second semester.*

CHEMISTRY

PROFESSOR GUILD.

The instruction in chemistry has two main objects in view: first, to promote general culture; and secondly, to introduce students to technical work, especially in mining. The first two years' work in general chemistry, qualitative and quantitative analysis, places the student in a position to take up advantageously the study of mining and metallurgy. The third year's work, metallurgical chemistry, can be pursued to advantage only by advanced students. The larger portion of the work, being investigative, requires on the part of the student a certain amount of originality and ingenuity in designing and carrying out experiments. The experience which a student may gain in this work is of great value to him in conducting an assay laboratory or in filling the position of superintendent of a metallurgical plant.

CHEMISTRY 1. GENERAL CHEMISTRY.—Lectures illustrating the chemical properties of the elements and their compounds, supplemented by recitations and laboratory practice. Text-book, Remsen's Briefer Course. Open to all students. *Five hours, or an equivalent, first semester.*

CHEMISTRY 2. QUALITATIVE ANALYSIS.—Practical work in the laboratory, including the analysis of alloys, commercial products, minerals, and like substances. The course is accompanied by lectures and recitations. Text-book, Eliot and Storer's Qualitative Analysis, and various reference books. Open to students who have taken Chemistry 1. *Five hours, or an equivalent, second semester.*

CHEMISTRY 3, 4. QUANTITATIVE ANALYSIS.—Laboratory practice, with lectures and recitations; gravimetric, volumetric, gasometric, calorimetric and electrolytic methods of analysis; quantitative analysis of silicates, minerals, and mattes. Text-books, Fresenius's Quantitative Analysis, Sutton's Volumetric Analysis, and various reference books. Open to students who have taken Chemistry 2. *Five hours, or an equivalent, both semesters.*

METALLURGICAL CHEMISTRY AND ASSAYING 1, 2.—Assaying of gold, silver and lead by the furnace method; bullion assaying according to the methods employed in the United States Mint; cyanide process for the extraction of gold; the assaying of cyanide solutions,

precipitation of gold, and the treatment of the zinc residues; the chlorination process; the leaching of silver ores by hyposulphite; preparation and analysis of alloys, with a study of their properties; analysis of iron and steel, fuels and furnace gases. Open to students who have taken Chemistry 5, 6. *Five hours, or an equivalent, both semesters.*

MINERALOGY

PROFESSOR GUILD.

The main object of the course in mineralogy is to familiarize the student with facts and methods which will enable him to determine the character of an ore or mineral by an observation of its physical properties and by the performance of a few simple tests with the blow-pipe. The value of such a course cannot be overestimated, since these quick methods of analysis are frequently needed in the field and mine when recourse cannot be had to a well-equipped chemical laboratory. The course is of value also to the student of general science, since it adds to the pleasure of a day in the mountains or field, and is necessary to a full appreciation of the study of geology. The course is not only practical, but the theoretical side of the subject receives attention in mineral optics, crystallography and similar topics.

MINERALOGY 1, 2.—Lectures and recitations in crystallography and the classification and uses of minerals; laboratory work in blow-pipe analysis and determinative mineralogy; work with the reflecting goniometer in measuring the angles of crystals, and with the polariscope in studying the optical properties of minerals; the study of a type collection of 600 minerals arranged and classified according to Dana. Text-books, Dana's Text-book of Mineralogy and Brush's Manual of Determinative Mineralogy and Blow-Pipe Analysis. Open to students who have taken Chemistry 2. *Five hours, or an equivalent, both semesters.*

ASTRONOMY

PROFESSOR BLAKE.

A short course of instruction in astronomy, in which are considered the relations of the earth to the solar and stellar systems is given as an introduction to the study of geology. The astronomy

being considered a part of geology is granted no independent credit toward any course of study. Open to Seniors. Lectures and recitations.

GEOLOGY

PROFESSOR BLAKE.

The purpose of the course in geology is to acquaint the student with the principles of the science and to give him such a practical knowledge of the subject as will be of use in the development and operation of mines.

ASTRONOMY AND GEOLOGY 1, 2.—Astronomical introduction (see Astronomy above); geognosy—the formation and composition of the crust of the earth, rock-forming minerals, crystalline and mechanically formed rocks; dynamic geology—volcanic formations, metamorphism, erosive agencies, transportation and deposition of rock-forming materials; structural geology—stratification and the movements to which strata have been subjected; stratigraphic and historical geology—the geological record, progress of life, theories of evolution. *Economic geology*; mineral deposits, veins, occurrence of ores and metals. *Mining and mining machinery*; methods of mining, transportation of ores, mechanical treatment of ores.

Lectures, illustrated by rocks and fossils in the museum, photographs, maps, drawings; occasional excursions to the field and to prominent mines. Text-books first semester: Todd's New Astronomy; Heilpin's Earth and its Story; Geikie's Text-Book of Geology and Class-Book of Geology; Dana's Manual of Geology. Text-books and reference books second semester: Kemp's Ore Deposits of the United States and Canada; Rothwell's Mineral Industry; Bowie's Hydraulic Mining; Reports of the United States Geological Survey; Transactions of the American Institute of Mining Engineers. Open to Seniors. *Five hours both semesters.*

DRAWING AND DESCRIPTIVE GEOMETRY

DIRECTOR HOLMES.

Under this head instruction is offered in artistic drawing designed especially for young women in the Freshman year; in instrumental drawing including training in machine design; and in descriptive geometry which is included in the three credits offered in drawing in group D.

DRAWING 1, 2. ARTISTIC DRAWING.—Elementary principles of drawing natural objects; outline drawing; perspective; light and shade; ornamental design; color in ornament; appreciation of the decorative arts. Open to all students. *Five hours, or an equivalent, both semesters.*

DRAWING 3, 4.—Graphical statics, kinematics and machine design taught in connection with mining and mechanical engineering. A knowledge of shopwork and drawing described below is highly desirable. Open to Juniors and Seniors. *Five hours, or an equivalent, both semesters.*

DESCRIPTIVE GEOMETRY 1, 2.—Orthographic projections; intersection of surfaces; spherical projections; shade and shadow; perspective; practical application to timber-framing, stone-cutting, sheet-metal work and to architectural draughting strongly emphasized. Text-book, Church's Descriptive Geometry and Shades and Shadows, with plates. Open to students who have taken or are taking Shopwork and Drawing 1, 2. *Five hours, or an equivalent, both semesters.*

SHOPWORK AND DRAWING

DIRECTOR HOLMES.

The purpose of the courses of instruction outlined below is to teach the properties and commercial classification of common materials of manufacture, the processes of manufacture, the use of tools and machines, and the design of tools, machines and other objects of utility. In equipment and design, the shop is modeled after the best examples in American practice.

The general method of instruction is as follows: In all the work explanation is made of the physical properties of the materials used, of the use and care of tools, of the theory of their action on materials, of the laying out of work and of the finishing of the object. Each student makes a series of graded exercises, and drawings of the same. Exercises assume as far as practicable the form of common objects of utility. Students are encouraged to apply the knowledge gained in any exercise to the design of original work.

SHOPWORK AND DRAWING 1, 2.—Shopwork: carpentry; pattern-making; forging. Drawing: tracing; blue-printing; shop drawings. Open to all students. *Five hours, or an equivalent, both semesters.*

SHOPWORK AND DRAWING 3, 4.—Shopwork: chipping and filing; vise-work in iron; use of engine lathe, shaper, planer, milling and other machines. Drawing: shop drawings; elements of machine design. Open to students who have taken Shopwork and Drawing 1, 2. *Five hours, or an equivalent, both semesters.*

ENGINEERING

PROFESSOR WOODWARD, PROFESSOR SMITH.

The courses offered under this head are selected with reference to the local conditions and needs of the territory. While they are made as technical as is possible without sacrificing in other directions, yet the fact is constantly borne in mind that engineering practice changes from year to year, and that a graduate who is thoroughly grounded in the principles of his profession will readily acquire the technical side. The former is necessary; the latter, desirable.

SURVEYING 1, 2.—Use and care of instruments, including plain and solar compasses, levels, transits; plane land surveying; United States system of land surveys; city, topographical, railroad and mine surveying; earthwork computations; determination of azimuth, latitude, longitude and time by observations on the circumpolar stars and on the sun. One full half-day each week is devoted to field practice; plots are made of field surveys and a topographic map of some area in the vicinity of Tucson is executed by each student. Lectures, recitations, drawing and field work; text-book, Raymond's Surveying. Open to students who have taken Trigonometry. *Three hours both semesters and Saturday forenoons.*

(Smith.)

MINE ENGINEERING 1.—Engineering work underground; methods of mining; ventilation; explosives; analytical design of a steel hoisting frame. Recitations and draughting. Open to students who have taken Mathematics 5, 6. *Five hours first semester.*

(Smith.)

METALLURGY 1.—Iron and steel; copper; lead; special reference to the mechanical operations of ore-reduction; complete analytical design of a roaster, smelter or some equally important structure will be given each year. Open to students who have taken Mathematics 5, 6. *Five hours second semester.*

(Smith.)

ENGINEERING CONSTRUCTION AND HYDRAULICS 1, 2.—*a*—Engineering construction first semester: materials of construction and their properties; masonry construction; culverts, bridge piers, dams, retaining walls, arches; graphical investigation of stability; use of concrete; foundations, pile and masonry, on land and in water; cofferdams, cribs, and caissons. *b*—Hydraulics second semester: velocity and discharge from orifices, weirs, tubes, and pipes; flow in sewers, ditches, canals, and rivers; energy of a jet; measurement of water power; water wheels of various types; pumping machinery. Text-book, Merriman's Hydraulics. Open to students who have taken Mathematics 5, 6. *Five hours both semesters.* (Smith.)

STEAM ENGINEERING AND PRIME MOVERS 1, 2.—Elementary thermodynamics; theory of the steam engine; types of engines; steam valves and valve diagrams; theory and use of the indicator; compound engines; heat and combustion of fuel; types of boilers; design of chimneys; gas, oil, and hot-air engines; solar engines; wind and water as natural sources of power. Text-book, Kinealy's Steam Engines and Boilers. Open to students who have taken Mathematics 5, 6. *Five hours both semesters.* (Woodward.)

The value of the engineering courses, especially in designing, is enhanced by a collection of blue prints of actual constructions. The University is indebted to Fraser & Chalmers of Chicago for a recent gift of blue prints of mining machinery, including a smelter, a roaster, a converter, hoisting frames, and stamp mills. As occasion offers excursions will be made to the important mining plants of the territory. During the present year a visit was made by the senior mining students with instructors to Bisbee, where, through the courtesy of Mr. Walter Douglas, superintendent of the Copper Queen Mining Company, the entire plant both below and above ground was inspected and studied under most favoring circumstances. Plans are maturing for two similar trips in the near future.

ORATORY

INSTRUCTOR MCGAUHEY.

The object of this course is to give instruction and training in the principles of expression. Special attention is paid to developing the voice, to strengthening all the powers of the voice and body and to bringing these powers into such perfect harmony that the

student may adequately express his ideas. The training leads to proficiency in the various lines of elocution and oratory.

ORATORY 1, 2.—Physical training, laws of health, voice culture, articulation, pronunciation, elements of modulation, physiology of the voice, cure of faults of voice and manner; recitation, rendering of thought, gesture, emphasis, grace and deportment; recitations committed to memory and delivered before the class. Open to all students. *Two hours both semesters.*

ORATORY 3, 4.—Analysis of higher forms of literature; interpretation; delivery of original orations. A knowledge of psychology, rhetoric, logic and English literature is highly desirable. Lectures and class drill. Open to students who have taken Oratory 1, 2. *Two hours both semesters.*

MILITARY SCIENCE AND TACTICS

LIEUTENANT-COLONEL ADAMS.

PRACTICAL COURSE.—Exercises on the drill ground covering (a) Infantry exercises in the schools of the soldier, company and battalion; extended order movements, target practice, reviews and parades. (b) Military signaling with flag; telegraphy. Required of all able-bodied male students throughout the Freshman and Sophomore years and elective during the remainder of the course.

THEORETICAL COURSE.—Recitations covering the Infantry drill regulations with lectures on military law, discipline, military history, and allied topics. Required of all commissioned and non-commissioned officers.

Students claiming exemption from drill will be required to secure a certificate of disability from a physician designated by the faculty unless the disability is apparent. Those so excused will be required to elect a subject in place of this course. The officers will be appointed from an eligible list determined by examinations, both scholarship and class standing being taken into account.

Each member of the military organization will be required to provide himself with the required uniform within six weeks after his entrance. A deposit covering the cost of the uniform should be made upon registration. The uniform consists of cap, coat and trousers of cadet gray cloth trimmed with black braid and closely resembles the undress uniform of the United States Military Academy at West Point.

SHORT COURSE OF INSTRUCTION IN ASSAYING

In order to meet the needs of persons who desire to learn the art of assaying the common ores and who have not the time required for a full four years' course of study, the Board of Regents has approved a short course of instruction in practical assaying, metallurgy, and allied subjects.

This course commences with the first semester in each year and requires at least two years; students are advised, however, to take the regular course in engineering and mining, if possible, since in two years they cannot expect more than to make a beginning in these subjects.

REQUIREMENTS FOR ADMISSION

Those desiring to take this course are required to be at least eighteen years of age, to have good health, and to have a knowledge of English, mathematics and elementary science sufficient to enable them to pursue the course with advantage. For elementary science, physics, and for mathematics algebra to quadratics is sufficient.

Instruction is gratuitous, but each student is required to pay a matriculation fee of five dollars and to pay the cost of materials, glassware, and apparatus used by him. For this purpose a deposit of ten dollars will be required in advance each semester and any balance will be refunded.

The right is reserved to vary this course according to the aptitudes or necessities of those concerned.

FIRST YEAR.

General chemistry, one semester.

Qualitative analysis, one semester.

Mathematics, two semesters.

English or Spanish, two semesters.

Practical free-hand drawing and shopwork, or physics, two semesters.

SECOND YEAR.

Mineralogy, blow-pipe analysis and fire assaying, two semesters.

Quantitative analysis and wet assaying, two semesters.

Mathematics, two semesters.

Geology, two semesters.

Text-Books.

The following text-books and others are used:

Chemistry—Remsen, Eliot & Storer, Fresenius.

Assaying—Ricketts, Brown, Furman, Aaron.

Mineralogy—Dana; Brush's Determinative Mineralogy, revised by Penfield; Dana's How to Study Minerals.

Geology—Dana, LeConte, Geikie.

ARIZONA SCHOOL OF MINES

SCHEDULE OF RATES FOR ASSAYING AND WORKING
ORES

In accordance with the Legislative enactment approved March 3, 1899, the rates for assaying heretofore in force under the law of March, 1897, have been changed. The fifty-cent rate is no longer in force. Former circulars and schedules of rates are revoked and withdrawn. Under the provisions of the new law, the Regents of the University of Arizona have established the following rates for assaying ores taken from deposits and mines in the territory of Arizona:

ASSAYING ORES FROM ARIZONA

Silver and Gold, or either.....	\$1.00
Silver, Gold and Copper.....	2.00
Copper.....	1.00
Lead.....	1.00
Zinc.....	1.00
Iron.....	1.00
Gold, Silver, Copper and Lead.....	2.50
Gold, Silver, Copper and Iron.....	2.50
Gold, Silver, Copper and Zinc.....	2.50

All assays are made in duplicate and in the most careful and thorough manner by an expert assayer.

PAYMENT IN ADVANCE REQUIRED.

The Director is required, in all cases, to hold the assay until the fee or charge therefor is paid. Remittances may be made by check or money order; or the money, securely wrapped, may be sent with the sample.

RATES FOR SAMPLING AND WORKING ORES.

Lots of 100 pounds or less, including assays of three metals.....	\$ 5.00
Each additional 100 pounds, to 500 pounds.....	1.00
Over 500 pounds, to 1 ton.....	10.00
Each additional ton.....	4.00
Ordinary stamp mill test and plate amalgamation, for first ton or fraction of a ton.....	20.00
From 1 to 2 tons.....	30.00
Pan amalgamation, including crushing and assays, ton.....	20.00
Large lots proportionately less; small lots more in proportion.	

CYANIDE PROCESS.

The School of Mines is prepared to make experimental tests of ores and of tailings by the cyanide process, in large or small quantities, at rates to be agreed upon with the Director.

Working tests and experiments by other processes may be undertaken at rates to be agreed upon in each instance, depending upon the amount of materials, time and labor required.

CONCENTRATING (INCLUDING ALL ASSAYS).

Wet or dry test of small lot (under 500 pounds).....	\$15.00
500 pounds to 1 ton.....	20.00
Each additional ton.....	7.00

QUALITATIVE TESTS.

The determination of the nature of rare and peculiar minerals, not requiring a chemical analysis, or an assay, is made gratuitously. Samples sent for this purpose should be in their original condition as broken out, and not crushed to a powder or pulp. Tests requiring determination of the presence of gold or silver must be paid for at assay rates. Samples may be sent by mail at the rate of one cent per ounce. They should be distinctly labeled inside of the

package by the name of the sender, and a letter should be posted at the same time giving the full name and address, and inclosing a stamp for the reply. This offer of free examination is intended to apply to minerals unknown to the sender and does not cover special tests for precious metals or for any metal the presence of which is usually determined by an assay.

HOW TO SEND SAMPLES.

For small samples, under four pounds in weight, the most expeditious and cheapest way is to send by the ordinary mail. If samples or letters containing the postal order are sent by registered mail, a delay of from one to three days is caused, as notice of arrival is given first and then the registered parcel must be sent for. A similar delay results from sending by express. The express company does not deliver parcels at the University. Delays often result from the want of identification. Sometimes the only clue to the name of the sender is the comparison of the handwriting upon the sample and that upon the letter. The postal laws permit the name of the sender to be written and inclosed in the package. Each sample should be labeled by a slip of paper, inside, giving the name and locality of the claim and the address of the sender.

The name of the claim is desired in order that the value and distribution of the mineral wealth of the territory may be better known.

NEW ASSAY LABORATORY.

Samples are now received and the assays are made in the new laboratory for mining and qualitative work. This laboratory is independent of and apart from the laboratory for students. A special expert assayer of experience is employed. The assays are not made by the students.

Special rates for freight on consignments to the "DIRECTOR OF THE SCHOOL OF MINES," are granted by the Southern Pacific R. R. from points in Arizona. Ask the agent at shipping point for particulars.

All business communications, checks and money orders should be addressed to the

ARIZONA SCHOOL OF MINES,

WM. P. BLAKE, Director.

TUCSON, PIMA CO., ARIZONA.

THE AGRICULTURAL EXPERIMENT STATION

STATION STAFF

THE PRESIDENT OF THE UNIVERSITY

R. H. FORBES, M. S.,	.. ..	Director and Chemist
A. J. McCLATCHIE, A. M.,	.. ..	Agriculturist and Horticulturist
G. H. TRUE, B. S.,	.. ..	Animal Husbandry
DAVID GRIFFITHS, Ph. D.,	.. ..	Botanist
W. W. SKINNER, M. S.,	.. ..	Assistant Chemist
T. D. A. COCKERELL,	.. ..	Consulting Entomologist
S. M. WOODWARD, A. M.,	.. ..	Consulting Meteorologist
W. O. HAYES,	.. ..	Clerk

ORGANIZATION AND WORK

The Agricultural Experiment Station is a legally constituted department of the University, whose purpose is "to aid in acquiring and diffusing * * * useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science."

With the above objects in view, the organization of the station includes the administrative office, and the departments of agriculture and horticulture, animal husbandry, botany and chemistry, the whole or a major portion of the time of one or more members of the station staff being devoted to each department of station work. Provision is made for meteorological and entomological work also, though to a less degree.

Owing to the wide variation in agricultural conditions in Arizona, it has been found of advantage to distribute the work so that each department is located, so far as possible, in the situation most favorable to the accomplishment of its own special results. According to this principle, the various lines of Experiment Station work have been distributed as follows:

The Director's office and the departments of botany and chemistry are maintained at Tucson in the University buildings. Through this arrangement, the Experiment Station profits by the buildings, libraries and associations of the University, while the Uni-

versity is benefited from time to time by the teaching ability of members of the station staff. It has been found that from this base of operations the three great agricultural districts of the territory—Salt River valley, the lower Colorado, and the upper Gila—are accessible with equal convenience for field work and observations.

On the same grounds—fitness in location for the work undertaken—the experiment station farm has been maintained and strengthened at Phoenix. Salt River valley is intermediate in elevation, in situation, and in mean yearly temperature between the other two important farming districts above mentioned, and for this reason the agricultural and horticultural results obtained there are capable of the most general application in the territory at large.

The date palm orchard again, is located in the alkaline district south of Tempe, where a successful demonstration of this palm as a commercial fruit producer will be of the greatest value, creating use for the great areas of alkaline land in the arid Southwest.

The range station also, for the study of worn-out range country with a view to its reclamation to usefulness, is located in a typical district near Tucson, and is conducted under the auspices of the department of botany.

The services of specialists in various subjects, such as entomology, meteorology and soil survey work have also been secured from time to time.

The results of the experiment station work are made public at frequent intervals in the bulletins and reports of the station. These publications are made in two series; first, the longer and more technical bulletins, stating in considerable detail the investigations as they mature, and secondly, the "Timely Hints for Farmers," which are brief writings issued at the time when they will be most useful, written in plain language, and presented in popular form. The annual reports also are for the most part written popularly, and afford a convenient and readable summary of each year's work as it comes to completion.

The station work conducted and published on the lines indicated above has a two-fold value. In the first place, the suggestions made or derived from the investigations of the station are of direct material profit to the agricultural public and may often be immediately applied to advantage in the solution of agricultural problems. In the second place, these writings are intended to serve an educational purpose, inasmuch as they are so presented as to constitute lesson sheets for the benefit of the careful reader. It may therefore

be considered that the Experiment Station reaches a class of some three thousand readers in the Southwest twice a month through its "Timely Hints" and other publications; the operations of the range study tract at Tucson, the experiment station farm at Phoenix, the date palm orchard at Tempe, and the sugar beet plots on the upper Gila serve also as an object lesson to the adjacent public.

It is believed that this distributed and mobile organization is especially effective, not only for the purposes of the Experiment Station, but also for those of the University as well, since it allows the station to conduct its work in localities suitable for the accomplishment of results; and again, it causes the public to become better acquainted with the territorial University, of which the station is a department.

ACKNOWLEDGEMENTS

The University gladly acknowledges the generous gift by the Copper Queen Consolidated Mining Company of three thousand dollars as aid in the erection of the manual training shops.

Thanks are due various publishers and individuals for a number of valuable books given to the library.

The museum has received during the past year many valuable specimens of rocks and minerals, and is especially indebted to Mr. Herbert Brown, of Yuma, for gifts of specimens in natural history, for rare Arizona fossils and remains of extinct animals.

SUB-COLLEGIATE DEPARTMENT

INSTRUCTORS

MILLARD MAYHEW PARKER, A. M., President
HOWARD JUDSON HALL, A. M., English
SHERMAN MELVILLE WOODWARD, A. M., Elementary Science
FRANK YALE ADAMS, A. M., History and Civics
DAVID HULL HOLMES, Shopwork and Drawing
GEORGE EDSON PHILIP SMITH, B. S., C. E., Physics
MRS. MARY BERNARD AGUIRRE, History and Spanish
MRS. EMMA MONK GUILD, English and Mathematics
MARY ELIZABETH PLIMPTON, A. M., English and French
OPAL LeBARON MCGAUHEY, B. E., English Reading and Physical Culture
LOUISE H. FOUCAR, B. Lit., Latin, Mathematics and Botany
MABEL GRAY HOOVER, Domestic Science
NORA TOWNER, Stenography and Typewriting
ELBERT J. HOLLINGSHEAD, Bookkeeping and Commercial Law

GENERAL INFORMATION

In this department the University carries on the work of a model High School, with the added advantages of the shopwork and drawing of the manual training department.

Students of sufficient age who have finished the study possible to them in their home schools are enabled to continue their preparation for college, at the University, under most favorable circumstances. The equipment of the scientific laboratories is available for use in this sub-collegiate work, wherever it can be used advantageously, and makes possible strong work in elementary science. The instructors in this department are assisted by the professors of the college department, several of whom regularly conduct sub-collegiate classes. By reference to the course of study which follows, it will be seen that it offers a comprehensive training for those who may not be able to pursue their studies further, while it gives a good preparation for college.

To each student who completes the studies of this course, a certificate stating that fact will be given, which certificate will entitle the holder to admittance to the University courses of instruction without examination.

COURSE OF STUDY

The following course of study will be required of all students who fit themselves at the University for entrance to the Freshman class in 1903. Such variations from it will be made during the next two years as will adapt it to the case of students already in the sub-collegiate department.

Military drill or physical culture is required of all able-bodied students throughout the course.

Numerals indicate number of recitations per week. Subjects marked * are elective. Two subjects must be chosen each year for the last three years from the electives.

FIRST YEAR

English	5	English Reading	2
Commercial Arithmetic ..	3	Elementary Science	5
American History	2	Drawing and Shopwork } or Domestic Science }	5

SECOND YEAR

English	2	English Reading	2
Algebra	5	*Latin	5
*Bookkeeping	5	Drawing and Shopwork } or Domestic Science }	5
General History	3		

THIRD YEAR

English	3	*Latin	5
Plane Geometry	5	*French	5
Civics	2	*Spanish	5
English Reading	2	*German	5
Parliamentary Practice ..	1	*Stenography	5
*Physiology ½, Chem- istry, ½	5	*Drawing and Shopwork } or Domestic Science }	5

FOURTH YEAR

English	4	*Latin	4
Algebra ½, Higher Arith. ½	4	*French	4
English Reading	2	*Spanish	4
Parliamentary Practice ..	1	*German	4
*Physics	5	*English History	3

MATHEMATICS

The course in arithmetic begins with percentage and includes a thorough review of the remainder of the subject. Special stress is laid on thoroughness and accuracy and a comprehension of the unity of the subject. Much time is given to mental examples in order to develop accuracy and rapidity in all mental operations.

In algebra special attention is given to the transition from arithmetic to algebra, to the fundamental operations and especially to factoring. The course includes as much as is found in any good text-book of algebra through quadratic equations.

Plane geometry occupies one year. This is so taught as to develop orderly habits of thinking and of investigation. To that end much original work is required, including practical problems involving the application of the principles learned.

ENGLISH

The course in English embraces grammar, composition and rhetoric, besides a critical study of assigned classics. It begins with a systematic study of grammar. Throughout the whole course attention is paid to work in composition, the aim being to enable the student to express himself clearly, accurately and with ease. In rhetoric much attention is paid to the principles of style and expression. The English classics studied in this department are those required for entrance to the University, as mentioned on page 23.

Under the general head of English reading the students are given drill in the elementary principles of reading and of elocution.

HISTORY

The aim of all the work in history is to lead the pupil to see the development of races and nations along political, social and religious lines, and to arouse in him a love for the subject and a habit of broad and discriminate reading.

American history is reviewed during the first year. Montgomery is used as a text-book with White's Outline Studies, but much collateral reading is required and the institutional side of the history is made prominent.

The work of the second year includes ancient, mediæval and modern history. The aim is to give the student an idea of the essential unity of history and the leading facts in the political devel-

opment of races and nations. Adams's European History is used supplemented by the reading of references contained therein.

Fiske's Civil Government in the United States is the text-book in civics. The historical development of the subject is made prominent while practical problems, such as taxation and municipal government, are made the subject of special investigation and study.

Coman and Kendall's History of England is used as the text-book in the fourth year.

LATIN, FRENCH, SPANISH AND GERMAN

For an outline of the course in Latin see pages 19, 20, under requirements for admission.

For an outline of the courses in French, Spanish and German see pages 26, 27, 28.

DRAWING AND SHOPWORK

The drawing course is designed to be helpful in the study of the arts and sciences wherever graphic representation of the subject is possible. Historic ornament is studied in connection with the history courses. Sketches of apparatus are made in connection with the courses in physics and chemistry. Accurate instrumental drawings are made of the exercises in geometry and shopwork. The application of useful drawing is thus apparent at every stage of the student's development. At the end of the year's course every student is required to design and make some useful article involving the application of the principles learned and the use of the tools with which he has become familiar.

The shop work consists of bench work in wood and of forge work. The course in bench work in wood consists of exercises with the different wood working bench tools, so arranged as to embrace the manipulations of the tools in their various applications. It will also include the most rapid and economical methods of preparing the wood for the machine. Turning of all kinds forms a part of the course. In the forge work students are carried through a series of graded exercises in both iron and steel.

DOMESTIC SCIENCE

The course in domestic science covers the preparation which the proper care of the house requires. It includes home hygiene, household science, chemistry of cooking, the study of foods and

practice in all kinds of cooking, plain and fancy sewing, nursing, care of the house, management of servants, social duties and customs of society.

BOOKKEEPING, STENOGRAPHY AND TYPEWRITING

Bookkeeping is taught by the modern budget system. The work is individual and each student may progress as fast as his time and ability permit. The course is thorough in all the details of office practice. The course includes instruction in commercial law. A complete course in stenography is offered, the Pitman system being used. The department is equipped with Remington typewriters.

PARLIAMENTARY PRACTICE AND DEBATE

The two higher classes in the sub-collegiate department devote one period of each week to work in parliamentary practice and debate. The classes are organized under a regular constitution and by-laws. Instruction is given in parliamentary law, Roberts's Rules of Order being used as a text-book. The members are required to introduce resolutions and prepare debates upon them and to appear at stated times with recitations and declamations. They are also given practice in performing the duties of secretary and in presiding in the meetings.

SCIENCE

It is the object of the course in science to initiate the student into the processes and methods used in laboratory work, to teach close observation, careful manipulation and logical deduction; to acquaint the student with the fundamental facts of the various branches of science and to give full practice in the use of good English in describing various observations and experiments.

An introductory laboratory course is given in the first year. The third year is given half to physiology and half to chemistry, pursued on the laboratory plan. During the fourth year a rigid course is given in physics, fully covering college preparatory physics with ample experimental work. Abundant apparatus and laboratory facilities are supplied for all these courses.

MILITARY ORGANIZATION 1900-01

Commandant of Cadets, Lieut.-Col. Frank Yale Adams, N. G. A.

STAFF AND MUSICIANS

Adjutant	Second Lieutenant Elbert J. Hollingshead.
Sergeant-Major	Norman J. Roberts.
Chief Trumpeter	Henry E. Castañeda.
Trumpeter	Benito G. Suarez.

COMPANY A

Captain	Rudolph Castañeda.
First Lieutenant	Philip M. Reilly.
Second Lieutenant	Duncan H. Campbell.
First Sergeant	Roy G. Mead.
Sergeant	Allan C. Bernard.
Sergeant	Elbert P. Drumiler.
Sergeant	Walter E. Hadsell.
Sergeant	Kirke T. Moore.
Corporal	William D. Whipple.
Corporal	Clanty C. Olney.
Corporal	Ross M. Russell.
Corporal	Christopher A. Smith.

COMPANY B

Captain	George M. Parker.
First Lieutenant	J. Newton Robinson.
Second Lieutenant	William T. Olney.
First Sergeant	George Martin.
Sergeant	Edward S. Stafford.
Sergeant	Courtland F. Day.
Sergeant	Marion B. Kays.
Sergeant	William E. Clark.
Corporal	A. Charles Alexander.
Corporal	Roy W. Moore.
Corporal	Frank G. Reynolds.
Corporal	William W. Dickinson.

SIGNAL CORPS

Captain	Edwin H. Andrews.
First Sergeant	Walter J. Wakefield.

ALUMNI ASSOCIATION

Organized June 2, 1897

CONSTITUTION

In order to promote the interests of the University, to secure unity among its graduates, and to foster an attachment to our Alma Mater, we do hereby constitute ourselves an association to be known as the ALUMNI ASSOCIATION OF THE UNIVERSITY OF ARIZONA.

I

All persons who have received a degree from the University of Arizona are members of this association.

II

All members of the faculty are honorary members of this association.

III

The officers of this association shall be a president, one vice-president from each successive group of five classes, provided that when the last group shall number three classes it shall thereafter be entitled to a vice-president; a secretary and a treasurer.

IV

There shall be an executive committee to consist of the following persons: The secretary and treasurer of the association, and three others chosen by the association, one of whom shall be designated as chairman of the committee.

V

It shall be the duty of the executive committee to arrange the programmes for Alumni Day and other public occasions; to regulate the finances of the association; to perform such other duties as may be imposed upon them, and to attend to all business of the association not otherwise provided for.

VI

The president shall be ex-officio a member of all committees. At each annual business meeting he shall appoint a committee of two persons to audit the treasurer's accounts.

VII

The officers and the executive committee shall be elected by ballot at the annual business meeting to be held on Alumni Day, a majority of all votes cast being necessary for election.

VIII

Any proposition to alter or amend these articles of the association must be made at a regular meeting, and have the assent of two-thirds of the members present.

ALUMNI OF UNIVERSITY OF ARIZONA

1895

Charles Oma Rouse, B. S., Clerk of Board of Supervisors of Pima county, Tucson, Ariz.

Mercedes Anna Shibell, B. S. (Mrs. M. A. Green), Teacher, 2103 Thompson street, Los Angeles, Cal.

Mary Flint Walker, B. S., Student University of California, 1895-97 ; Teacher, Benson, Ariz.

1897

Clara Cramond Fish, B. S., Teacher, Tucson, Ariz.

George Ojeda Hilzinger, B. S., Court Interpreter, Tucson, Ariz., 1898 ; student in School of Law, Ann Arbor, Mich.

Mark Walker Jr., B. S., Assistant Chemist University of Arizona, 1898 ; Commercial Assayer University of Arizona 1899 ; Superintendent of Exposed Reef Mining Co., Reef, Ariz.

1898

Hattie Ferrin, B. S., Teacher, Tucson, Ariz.

Granville Malcom Gillett, B. S., Draughtsman, Surveyor General's office, Tucson, Ariz.

Minnie Watts, B. S. (Mrs. Dr. W. B. Smith) Teacher, Altaville, Cal.

*John Desha Young, B. S., Assayer Elkhart Mining Co., Chloride, Ariz.

*Died April 8, 1899.

1899

Robert L. Morton, B. S., Assayer, Yuma, Ariz.

1900

Ida Clarissa Flood, B. S., Teacher, Tucson, Ariz.

Samuel Pressly McCrea, B. S., Teacher ; Student, Stanford University, Palo Alto, Cal.

Charles Pierce Richmond, B. S., Assayer, Congress, Ariz.

Florence Russell Welles, B. S., Teacher, Tucson, Ariz.

DEGREES CONFERRED 1900

BACHELOR OF SCIENCE

Ida Clarissa Flood

Samuel Pressly McCrea

Charles Pierce Richmond

Florence Russell Welles

REGISTER OF STUDENTS

1900-1901

GRADUATE STUDENTS

Cowan, Edith Clement (A. M., Due West College)	....	
Spanish	....	Tucson
Rogers, Anne E. (A. B., Centenary Female College),		
Pedagogy	....	Tucson

SENIORS

Andrews, Edwin Harold	....	San Francisco, Cal.
Castañeda, Rudolph	....	Benson
Ferrin, Clara	....	Tucson
Parker, George Millard	....	Tucson

JUNIORS

Blumenkranz, Moses	....	St. Louis, Mo.
Brown, Ruth	....	Tucson
Haynes, Felix Grundy	....	Casa Grande
Parker, Grace Miles	....	Tucson
Reid, Ida Christina	....	Tucson
Reilly, Philip Matthew	....	New York City
Smith, Bertram Louis	....	Phoenix
Smith, Bessie	....	Tucson
Wakefield, Walter James	....	Tucson

SOPHOMORES

Campbell, Duncan Hugh	....	Prescott
Christy, Fred Chase	....	Phoenix
Dunham, Ozra Kenneth.	....	Santa Monica, Cal.
Gillett, Leslie Alexander	....	Phoenix
Ham, Harold Allen	....	Phoenix
Kays, Marion Reed	....	Phoenix
Stout, Charles Signor	....	Tucson

FRESHMEN

Ballance, Harry Greene	....	Willcox
Bley, John Payran	....	Pasadena, Cal.
Cauthorne, Emily Burns	....	Tucson
Culver, Emma Louise	....	Tucson

Drane, Richard Lamar	....	....	....	Mesa
Drumiler, Elbert Perl	....	....	....	Congress
Harrison, Eleanor Hargrave	....	....	....	Tucson
Holmesley, Georgia Ann	....	....	....	Tempe
Katzenstein, Alma Fanny	....	....	....	Tucson
Mead, Roy Gibbons	....	....	....	Patagonia
Norway, Ora Elinor	....	....	....	Los Angeles, Cal.
Reynolds, William Graham	....	....	....	San Mateo, Cal.
Robinson, James Newton	....	....	....	Safford
Whiteside, William Herschel	....	....	....	Youngstown, Ohio

UNCLASSIFIED

Balcom, William Elder, Chemistry and Spanish,				Santa Paula, Cal.
Fish, Frank Wakefield, Mining	....	....	....	Tucson
Goodwin, James Cooper, Mining	....	....	....	Globe
Harrison, William H., Assaying	....	....	....	Tucson
Hawley, Fred Graham, Mining	....	....	....	Los Angeles, Cal
Hollingshead, Elbert John, History and English,				Phoenix
Hurley, Thomas Jay, Mining	....	....	....	Brooklyn, N. Y.
Martin, Ida Reyner, English and Spanish..				Tucson
Nash, John T., Surveying	....	....	....	Thatcher
Sewell, Russell, Mining	....	....	....	Cedartown, Ga.
Small, Mary Blanche, French	....	....	....	Sacramento, Cal.

FOURTH SUB-COLLEGIATE

Alexander, Andrew Charles, Jr.	....	....	....	Fort Thomas
Anderson, Quintus James	....	....	....	Tucson
Barkley, Hassie May	....	....	....	Glendale
Bernard, Allen Chouteau	....	....	....	Tucson
Castañeda, Henry Elias	....	....	....	Benson
Day, Courtland Francis	....	....	....	Duncan
Fish, Florence	....	....	....	Tucson
Marshall, Thomas K	....	....	....	Mammoth
Martin, George, Jr.	....	....	....	Tucson
Moore, Kirke Tonner	....	....	....	Tucson
Murphey, Carobel	....	....	....	Tucson
Olney, William Thomas	....	....	....	Solomonville
Roberts, Norman John	....	....	....	Benson
Russell, Ross Moody	....	....	....	Phoenix
Soldini, Constance Rosalie	....	....	....	Tucson
Stafford, Edward Sarterlie	....	....	....	Safford
Whipple, William Dominicus	....	....	....	Clifton

THIRD SUB-COLLEGIATE

Abbott, Lottie Fuller	....	....	....	Tombstone
Aldridge, Conrad Milton	....	....	....	Tucson
Barry, Eddie Rains...	....	....	....	Safford
Bartlett, Pearl A.	....	....	....	Tucson
Batchelder, Mae	....	....	....	Tombstone
Bell, Elizabeth....	....	....	....	Tucson
Bernard, Fred Horton	....	....	....	Tucson
Brown, Alice May	....	....	....	Tucson
Burson, Claude B	....	....	....	Wickenburg
Cabral, Juan Gonzales....	....	....	....	La Colorada, Mex.
Cadwell, Ralph	....	....	....	Willcox
Cheyney, Berenice	....	....	....	Tucson
Cheyney, Frances	....	....	....	Tucson
Clark, William Enoch	....	....	....	Solomonville
Cosgrove, Bard L.	....	....	....	Wickenburg
Dickinson, William Wallace, Jr....	....	....	....	Little Rock, Ark.
Dohoney, John	....	....	....	Flagstaff
Feldman, Mabel	....	....	....	Tucson
Fiske, Fannie May....	....	....	....	Globe
Godfrey, Frank Ray	....	....	....	Bisbee
Goldtree, Leo Keller	....	....	....	Tucson
Hadsell, Walter Elias	....	....	....	Buckeye
Hamilton, Loyal Gertrude....	....	....	....	Tucson
Ijams, Sheldon....	....	....	....	Safford
Kaub, Helen Elizabeth	....	....	....	Chicago, Ill.
Kilgore, Roy Bartley	....	....	....	Williams
Kirkpatrick, May	....	....	....	Kingman
Leon, Antonio Solano	....	....	....	Tucson
Lopez, George Peter	....	....	....	Tucson
Lowell, Gertrude Sophia	....	....	....	Tucson
Luketich, Peter	....	....	....	Budna, Austria
Mansfeld, Phyllis	....	....	....	Tucson
Marlar, William Edward	....	....	....	Phoenix
Mead, Minnie Jean	....	....	....	Patagonia
Merrill, Charles Henry	....	....	....	Fort Grant
Minus, Clarence Amos....	....	....	....	St. George, S. C.
Moore, Nino	....	....	....	Tucson
Moore, Roy Webb	....	....	....	Tucson
Moorfoot, Charles Roy	....	....	....	Bisbee

Mosher, Louise Glenn	....	....	Prescott
Murphey, Robert Bivins	....	....	Tucson
Myers, Gertrude Adelaide	....	....	Tucson
Olney, Clanton Claborn	....	....	Solomonville
Pascoe, Benjamin Franklin, Jr.	....	....	Clifton
Payne, Alfred Edward	....	....	Clifton
Pendleton, Rose	....	....	Globe
Perry, Mary E.	....	....	Tucson
Priest, Raymond Marshall	....	....	Yuma
Purcell, Stella Teresa	....	....	Tucson
Reynolds, Francis Meredith	....	....	San Mateo, Cal.
Robertson, Edith	....	....	Tombstone
Scow, Oliver	....	....	Dos Cabezas
Smith, Christopher Andrew	....	....	Arizola
Tarbox, Birdie Evaline	....	....	Tucson
Thomas, Samuel Pierce	....	....	Tucson
Whittle, Callie	....	....	Tucson
Wilbur, Mary Strange	....	....	Tucson

SECOND SUB-COLLEGIATE

Alexander, Albert Lea	.....	....	Fort Thomas
Allison, Mamie Jane	....	....	Tucson
Bell, Helen Margaret	....	....	Tucson
Bernard, Noah Curry	....	....	Tucson
Brena, Pedro	....	....	Tucson
Brookner, Laura May	....	....	Globe
Brown, Harriet Estella	....	....	Tucson
Brown, James Kilroy	....	....	Tucson
Clarke, Edna May	....	....	Tucson
Cole, Leah Margaret	....	....	Phoenix
Connell, Henrietta Fenwick	....	....	Tucson
Contreras, Stefana	....	....	Tucson
Crable, Francis Drake	....	....	Tombstone
Cromb, Annie Russell	....	....	Clifton
Davis, Hattie Louisa	....	....	Contention
Drachman, Lucille	....	....	Tucson
Ferrin, Arthur Harry	....	....	Tucson
Fetterly, Zena Ownby	....	....	Tucson
Garner, Lillian Bertha	....	....	Tucson
Hauser, Julius	....	....	Willcox
Hildreth, James Albert	....	....	Safford

Jeter, Earnest	....	....	....	Safford
Jones, Ernest	....	....	....	Tucson
Kelly, Fred	....	....	....	Tucson
Marlar, Claude George	....	....	....	Phoenix
Mayer, Wilbur Joseph	....	....	....	Mayer
Meston, Archibald Forbes	....	....	....	Tucson
Montoya, Erminia	....	....	....	Tucson
Moreno, Sara Mary	....	....	....	Globe
Nash, Robert Lafayette	....	....	....	Safford
Page, Alfonse Clide	....	....	....	Tucson
Pollock, Laura Bernice	....	....	....	Globe
Purcell, Weda Ina	....	....	....	Tucson
Pusch, Gertrude	....	....	....	Tucson
Redd, Paul Chester	....	....	....	Tucson
Redman, Herbert Reese	..	....	....	Tucson
Riggs, Edward Murray	....	....	....	Willcox
Samuels, Katherine Mary	....	....	....	Tucson
Scott, Phillips Clark	....	....	....	Tucson
Shanley, Nannie	..	....	....	Globe
Spinas, Nellie	....	....	....	Florence
Steele, Wilfred	....	....	....	Willcox
Stratton, Elmer W	....	....	....	Tucson
Suarez, Benito Guadalupe	....	....	....	Solomonville
Tavis, Granville Oury	....	....	....	Teviston
White, Charles Boyd	....	....	....	Dos Cabezas
Wood, Leslie Margaret	....	....	....	Bonita
Zellweger, Elsie	..	....	....	Tucson

FIRST SUB-COLLEGIAGE

Bell, Wesley Jesse	....	....	....	Jerome
Bennett, Frank Riley	....	....	....	Redington
Brady, Margaret Anna	....	....	....	Tucson
Brown, Clara Agnes	....	....	....	Tucson
Brown, John Stephenson	....	....	....	Tucson
Buehman, Albert Rex	....	....	....	Tucson
Clarke, Edward Charles	....	....	....	Tucson
Drumiler, Chester Arthur	....	....	....	Congress
Elias, Antonio	....	....	....	Tucson
Estrada, Jose Pesquera	....	....	....	Minas Prietas, Mex.
Gonzalez, Antonio	....	....	....	La Colorada, Mex.
Grainger, Herbert Elwood	....	....	....	Tucson

Grant, William	....	....	....	....	Tucson
Gruninger, Ora Grover	....	....	....	....	Tucson
Harley, James Wardner	....	....	....	....	Nogales
Hayes, Zee	....	....	....	....	Globe
Kane, Ida	....	....	....	....	Patagonia
Ladd, Edward Joseph	....	....	....	....	Phoenix
Laos, Teofilo	....	....	....	....	Tucson
McEwen, Virgil Ray	....	....	....	....	Fort Thomas
McKenna, Manuel Sosa	....	....	....	....	Tucson
Mansfeld, Monte	....	....	....	....	Tucson
Marrs, John Silas	....	....	....	....	Tombstone
Myers, Emma	....	....	....	....	Tucson
Ochoa, Mary Louise	..	....	....	....	Tucson
Owens, Dora Anna	....	....	....	....	Safford
Paul, Edgar Havlin	..	....	....	....	Tucson
Pease, Ione Gertrude	....	....	....	....	Tucson
Peralta, Cruz	....	....	....	....	Tucson
Pusch, George William	....	....	....	....	Tucson
Rose, George	....	....	....	....	Globe
Rose, William	....	....	....	....	Globe
Soldini, Charlotte Virginia	....	....	....	....	Tucson
Stout, Albert Hamilton	....	....	....	....	Tucson
Sultan, Edgar	....	....	....	....	Globe
Trenberth, Edwin Hercules	....	....	....	....	Providence
Villaescusa, Philip	....	....	....	....	Tucson
Wager, Elwood Roy	....	....	....	....	McCabe
Webster, Roger	....	....	....	....	Benson
Weissenborn, Annette Irene	....	....	....	....	Appleton, Wis.

UNCLASSIFIED

Anspach, Clarence A. Sayler, Stenography and Spanish	....	....	....	....	Tucson
Connell, Frances Safely, Stenography and Bookkeeping	....	....	....	....	Tucson
Dabney, Parker R., English and Mathematics	....	....	....	....	Glendale
Felix, Arthur E., Stenography	....	....	....	....	Tucson
Griggs, Ethel, Stenography	....	....	....	....	Tucson
Hayes, Wilbur Oliver, English and Algebra	....	....	....	....	Tucson
McCulloch, Mrs. Katherine, Stenography and Spanish	....	....	....	....	Tucson
McEwen, William Edward, Shopwork and Drawing	....	....	....	....	Tucson

Mayer, Mary Belle, Stenography and Bookkeeping..	Mayer
Quinn, Harry J., Spanish and Bookkeeping	Detroit, Mich.
Richardson, Nellie Beryl, Stenography and Spanish..	Tucson
Roca, Lydia, Stenography and Spanish..	Tucson
Rush, Clara, Stenography and Typewriting	Tucson
Siewert, Elsie, French and Spanish	Tucson
Slaughter, Jennie Violet, Stenography and Typewrit- ing	Bisbee
Wood, Pauline Clifton, Stenography....	Tucson

SUMMARY

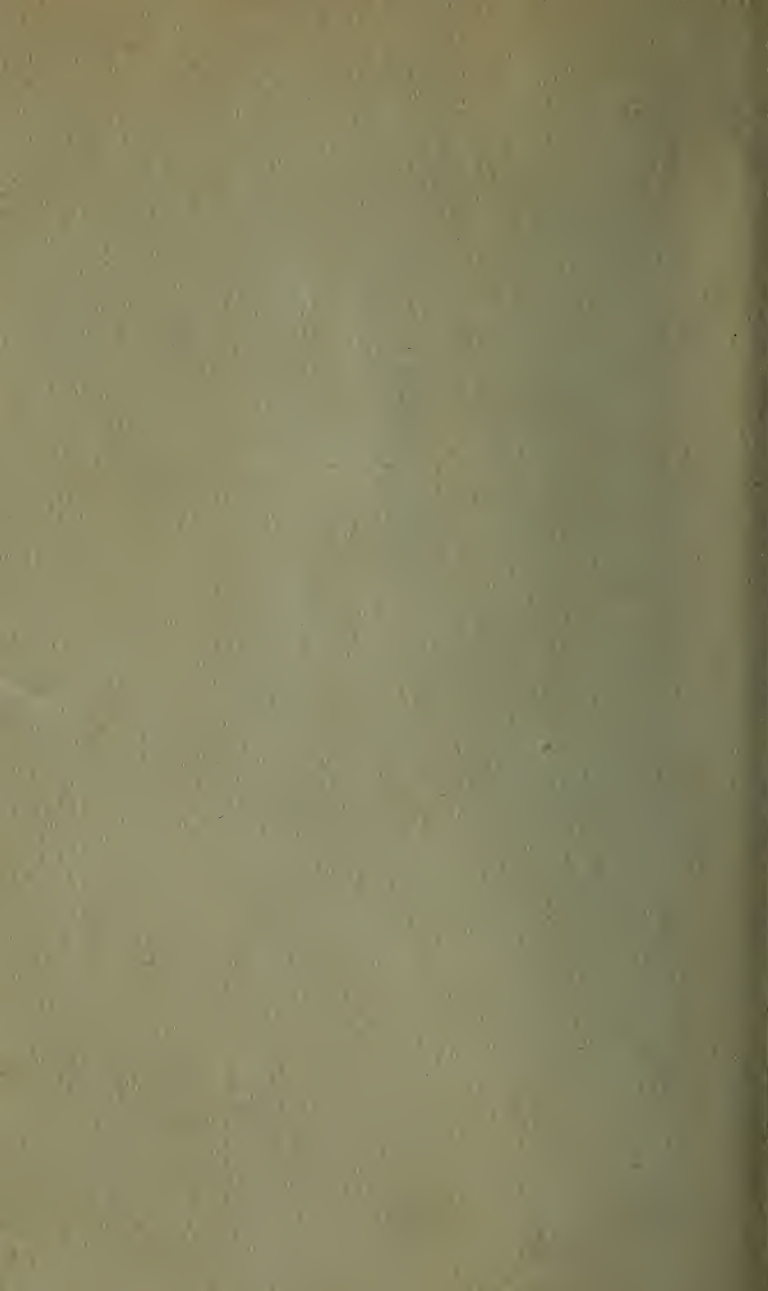
Graduate Students	2
Seniors....	4
Juniors	9
Sophomores	7
Freshmen	14
Unclassified Collegiate	11
Fourth Sub-Collegiate	17
Third Sub-Collegiate	57
Second Sub-Collegiate	48
First Sub-Collegiate	40
Unclassified ...	16
Total	225

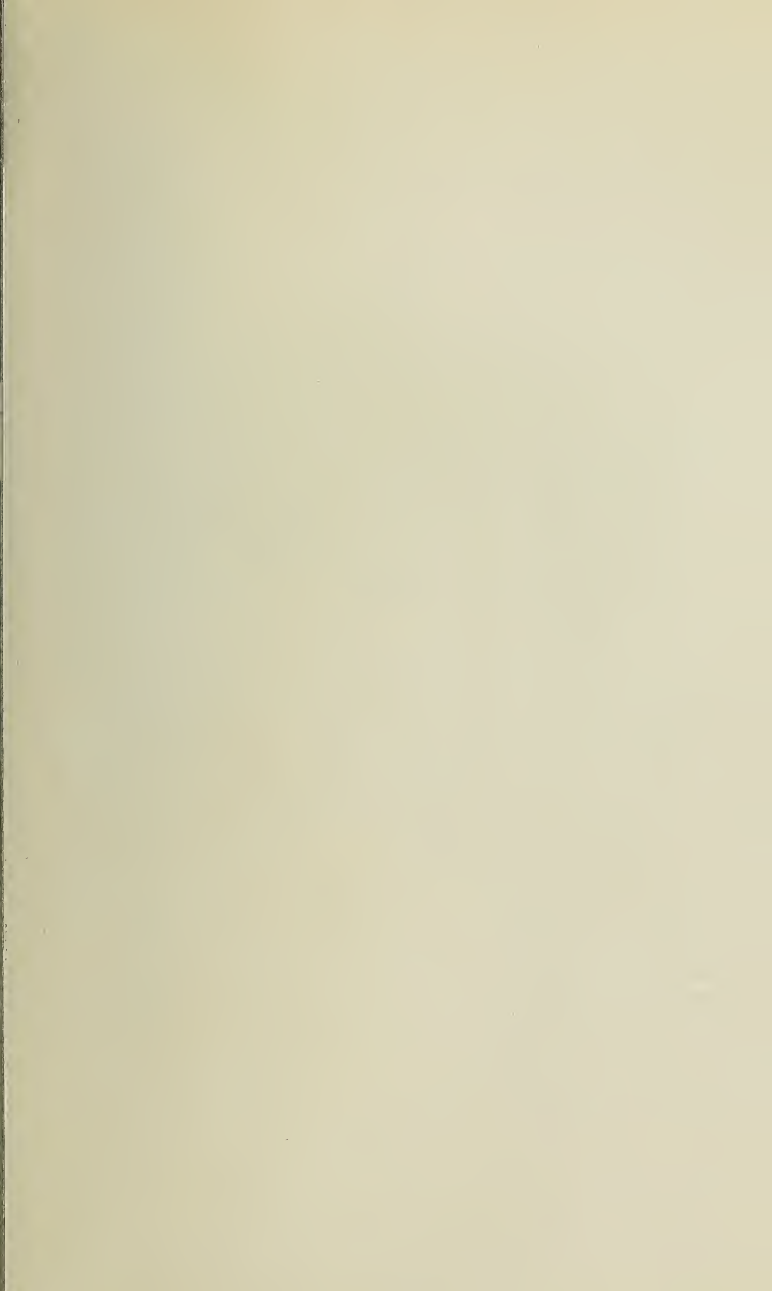
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